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ABSTRACT

This compilation provides 256 abstracts of research completed in the areas of health, physical education, recreation, dance, and allied areas during 1989. Master's theses and doctoral dissertations are abstracted from institutions offering graduate programs in those fields. The volume includes an index to the abstracts in which references are arranged under the subject headings in alphabetical order. All abstracts are numbered in alphabetical order according to institution; names of institutional representatives submitting abstracts are indicated. (AMH)

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VOLUME 32, 1990

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In Health, Physical Education, Recreation & Dance

Including International Sources

VOLUME 32-1990 EDITION

COMPLETED RESEARCH

In Health, Physical Education, Recreation & Dance

Including International Sources

Covering Research Completed in 1989

Edited by CRAIG CHAMBERLIN
for the RESEARCH CONSORTIUM of the
AMERICAN ALLIANCE FOR HEALTH, PHYSICAL EDUCATION,
RECREATION AND DANCE.

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Purposes of the American Alliance for Health, Physical Education, Recreation and Dance

The American Alliance is an educational organization, structured for the purposes of supporting, encouraging, and providing assistance to member groups and their personnel throughout the nation as they seek to initiate, develop, and conduct programs in health, leisure, and movement-related activities for the enrichment of human life.

Alliance objectives include:

1. Professional growth and development--to support, encourage, and provide guidance in the development and conduct of programs in health, leisure, and movement-related activities which are based on the needs, interests, and inherent capacities of the individual in today's society.
2. Communication--to facilitate public and professional understanding and appreciation of the value of health, leisure, and movement-related activities as they contribute toward human well-being.
3. Research--to encourage and facilitate research which will enrich the depth and scope of health, leisure, and movement-related activities; and to disseminate the findings to the profession and other interested and concerned publics.
4. Standards and guidelines-to further the continuous development and evaluation of standards within the profession for personnel and programs in health, leisure, and movement-related activities.
5. Public affairs--to coordinate and administer a planned program of professional, public, and governmental relations that will improve education in areas of health, leisure, and movement-related activities.
6. To conduct such other activities as shall be approved by the Board of Governors and the Alliance Assembly, provided that the Alliance shall not engage in any activitiy which would be inconsistant with the status of an educational and charitable organization as defined in Section 501(c) (3) of the Internal Revenue Code of 1954 or any successor provision thereto, and none of the said purposes shall at any time be deemed or construed to be purposes other than the public benefit purposes and objectives consistent with such educational and charitable status.

Bylaws, Article III

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INTRODUCTION

This compilation lists research completed in the areas of health, physical education, recreation, dance, and allied areas during 1989. It is arranged in two parts:

I. Index to Abstracts. In this section, references are arranged under the subject headings in alphabetical order. Instructions for using the index are given at the beginning of the section.

II. Theses Abstracts. These are master's and doctor's theses from institutions offering graduate programs in health, physical education, recreation, dance, and allied areas. Institutions reporting are listed beginning on page 155. Most references are accompanied by abstracts of the research, and all are numbered in alphabetical order according to institution. Names of institutional representatives sending in these abstracts are indicated in parentheses after the names of the institution; major professors are in parentheses after each reference.

Universities and colleges are encouraged to submit abstracts of theses completed at their institutions for inclusion in the next issue of *Completed Research.* Material should be sent to Craig Chamberlin, Chairman of Theses Abstracts.

Craig Chamberlin
Editor, Completed Research

7

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ABBREVIATIONS APPEARING IN THESE ABSTRACTS

AAHPERD = American Alliance for Health, Physical Education, Recreation and Dance (abbreviate all familiar organizations, e.g., AAU, NCAA, etc.)
acd = academic or academically
ACSM = American College of Sport Medicine
AD = athletic director
admin = administration
AE = absolute error
ALT-PE = Academic Learning Time - Physical Education
amt = amount
anal = analysis or analyses
ANCOVA = analysis of covariance
ANOVA = analysis of variance
app = approximately
assoc = association or associated
ATPase = adenosine triphosphate
ave = average
BB = basketball
bf = body fat
BP = blood pressure
bpm = beats per minute
BTPS = body temperature pressure saturated
bw = body weight
C = centigrade, Celcius
CA = chronological age
CE = constant error
CG = center of gravity
chem = chemical
chol = cholesterol
CI = contextual interference
CO = county
CO_2 = carbon dioxide
coll = college or colleges
comm = community
curr = curriculum
CV = cardiovascular
DBP = diastolic blood pressure
° = degree
DEPT = department
dev = develop or developmental
diff = difference, differences, differentiate or difficult
DV = dependent variable
educ = education

EKG = electrocardiogram
ELE = elementary
EMG = electromyogram
EMR = educable mentally retarded
exp = experiment, experimental or experience
F = Fahrenheit, F ratio, female or females
fb = feedback
fed = federal
FEV_1 = forced expiratory volume
fit = fitness
gm = gram
govt = government
gp = group
GPA = grade point average
gr = group
grad = graduate, graduation
HC = handicapped
HE = health education, health
HR = heart rate
HS = high school
ht = height
IEMG = integrated electromyographic activity
insig = insignificance or insignificant
IQ = intelligence quotient
JC = junior college
JHS = junior high school(s)
JV = junior varsity
kg = kilogram
kg/m = kilogram per meter
kpm/min = kilopondmeter per minute
KR = knowledge of results
lab = laboratory
LD = learning disability
lit = literature
M = mean, male or males
MA = mental age
max = maximum or miximal
meas = measure, measurement
mf = motor fitness
MMR = mildly mentally retarded
mph = miles per hour
MR = mental retardation
MS = middle school
msec = millisecond(s)
MT = movement time

mvmt = movement
n = number (e.g., of Ss) all numbers in arabic form (e.g., 1 = one, 5 = five, 100 = one hundred)
N_2 = nitrogen
natl = national
NBA = National Basketball Association
neg = negative
no. = number (in text, e.g., the total no. of days . . .)
O_2 = oxygen
% = percent
P = probability ($p < .05$ = significance greater than .05 level; $p > .01$ = nonsignificance at the .01 level)
PE = physical education
PH = public health
pos = positive
PR = pulse rate
prog = program
psi = pounds per square inch
psych = Psychology, psychological
pt = point
PWC_{170} = physical work capacity, PWC (level of HR unspecified)
Q = cardiac output
r = correlation
REC = recreation
rehab = rehabilitation
rep = repetition or repetitions
ROM = range of motion
RPE = rate of perceived exertion
RPP = rate pressure product
rpm = revolutions/min
RT = reaction time
RV = residual lung volume
S = subject, S's = subject's (possessive); Ss = subjects
SBP = systolic blood pressure
sched = schedule
SD = standard deviation
SHS = senior high school(s)
sig = significant or significance
sq = square
st = state
stdnt = student
STPD = standard temperature pressure dry
SV = stroke volume

t = t-ratio
tchr = teacher
temp = temperature
TMR = trainable mentally retarded
TRT = total response time (RT + MT)
univ = university or universitites
US = United States
USSR = Union of Soviet Socialist Republics
VE = variable error
V_E = expired ventilation
VO_2 = oxygen consumption
vol = volume
V_T = tidal volume
wt = weight
x = times
x^2 = chi square
YMCA = Young Men's Christian Association
YMHA = Young Men's Hebrew Association
YWCA = Young Women's Christian Association

NOTE:

1. Measurements are abbreviated (without periods) such as:
   in = inch; sec = second; wk = week; hr = hour;
   m = meter; ml = milliliter; mm = millimeter;
   min = minute; mo = month; oz = ounce; yd = yard, ect.

2. Whenever possible, performance tests are abbreviated (eg., CPI = California Psychological Inventory; Cattell 16 PF = Cattell 16 Personality Factor Questionnaire; MMPI = Minnesota Multiphasic Personality Inventory)

3. U.S. Postal Service abbreviations are used for states (e.g., AL = Alabama)

INDEX TO ABSTRACTS

This index enables the reader to refer to the items of completed research listed in the Theses Abstracts. Research topics are arranged in alphabetical order. The reference number following each topic corresponds to the listings of completed research dealing with that topic in the Theses Abstracts.

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APPALACHIAN STATE UNIVERSITY **(R.L. JOHNSON)**
BOONE, NORTH CAROLINA

1. FENDER, M.A. The effect of nutrition education on body composition of aerobic dance participants. MS in Physical Education, 1990 (B.J. Warren)

The purpose of this study was to determine the effect of nutrition educ on body composition of aerobic dance participants. The Ss were 50 F with a M (± SD) age of 19 (± 3.02) yr. The control gp (NNE) consisted of 23 Ss and the exp gp (NE) consisted of 27 Ss. The 8 wk 60 min high-impact aerobic dance classes were attended 3 days per wk. The NE gp participated in nutrition educ classes once weekly (weeks 2-7). Pre and post tests were conducted on the following variables: wt, ht, girth meas, bf %, sum of skinfolds, HR, BP, and a nutrition knowledge quiz. An ANOVA revealed no sig diff between the 2 gps except for the nutrition knowledge quiz scores in favor of the NE gp ($p < .05$). 11 Ss randomly selected from both gps participated in an energy expenditure assessment and a MVO_2 exp. The results from these tests compared favorably with similar studies. The combined group M energy expenditure of this aerobic dance protocol was 238.44 kilocalories for the 30 min dance session. T-tests revealed sig diff between pre and post test values for the combined gps in % bf, nutrition knowledge quiz, and kilocalories consumed. In conclusion, neither regular aerobic dance alone nor combined with nutrition educ promoted beneficial body comp changes.

ARIZONA STATE UNIVERSITY **(P. MARTIN)**
TEMPE, AZ

2. BALDINI, F.D. Substrate availability and utilization during prolonged submaximal exercise under the influence of smokeless tobacco. Ph.D. in Exercise Science, 1989

The objective of this dissertation was to examine the influence of smokeless tobacco (ST) on substrate availability and utilization during prolonged submax exercise (PSE). Pilot work leading up to this study had shown that: 1) HR and BP were affected by ST at rest and during exercise. As the intensity of exercise increased, these effects were less.2) Short-term, high-intensity work performance, as meas by the Wingate Anaerobic Test, was unaffected by ST.The high intensity of the exercise stimulus appeared to override any ST stimulation. 3) ST did not affect the VO_2max achieved during a progressive exercise test. Again, the intensity of the exercise appeared to override any stimulation due to ST. 4) The lactate threshold was delayed during a progressive exercise test to VO_2max when done under the influence of ST. 5) More fat appeared to be used as a fuel source during PSE under the influence of ST, as estimated from lower respiratory exchange ratios (RER). In this study, 11 untrained M ST users performed 6 exercise tests; one max aerobic power test (VO_2max), one submax exercise test (VO_2 submax), and 4 PSE tests. The PSE tests included one test with and one test without each individual's M dose of ST at intensities set -2 METs and -1/2 MET from the VO_2 corresponding to 4mM lactate, as determined during the VO_2 max and VO_2 submax tests. During the PSE test, VO_2, HR, RER, and RPE were meas during 40 min of exercise. Blood was drawn at rest prior to ST admin, 10 min after ST admin, and 3 times during exercise. Blood was analyzed for hemoglobin, hematocrit, free fatty acids (FFA), glucose, insulin, lactate, glycerol, norepinephrine (NorE), and epinephrine(Epi). There tended to be a greater availability of glucose and FFA prior to and during PSE under the influence of ST. There also was an increased reliance on fat as a fuel during PSE following the admin of ST. The reasons for this higher fat use and the source of the fat are not known. The Epi response alone did not explain the changes reported. It is possible that the pharmacologically active substances (primarily nicotine) in ST caused these changes. In conclusion, ST use prior to exercise does not appear to greatly enhance or inhibit physical work performance. The idea that ST may spare limited glycogen stores by increasing the reliance on fat as a fuel during exercise has not been demonstrated by this study.

3. BOORMAN, M.A. Effect of age and menopausal status on cardiorespiratory fitness in masters women endurance athletes. 1990 (C.L. Wells)

69 highly trained masters F endurance runners and swimmers ages 35 to 74 yrs were tested to examine the relationship between age and cardiorespiratory efficiency (VO_2 max and VO_2 submax). The effect that menopause had on these variables was also examined. Runners (N=53) were younger ($P < 0.05$) and had 24% higher VO_2max (ml.kg^{-1}.min^{-1}) values than swimmers (N=16) ($p < 0.05$). Submax VO_2 (3.4 mph, 8% treadmill grade) was lower in the swimmers ($p < 0.05$), but HR submax was 16 beats higher than the runners ($p < 0.05$). The 35-39 yr old runners had sig higher VO_2 max (54.51+6.88 ml.kg^{-1};min^{-1}) values than all other age gp runners ($p < 0.05$). HR max was not different between age gps in either runners or swimmers ($p < 0.05$). Pre-menopausal, transitional, and post-menopausal gps were not sig diff ($p < 0.05$) on any exercise variables when age and training diff among the gps were statistically controlled. A decrease in VO_2 max of .64 ml.kg^{-1}.min^{-1}.year^{-1} in the runners and .30 ml.kg-1.min-1.year-1 in the swimmers was determined. It was concluded that these highly trained masters F endurance runners and swimmers differed in cardiorespiratory fitness, menopause did not have an effect on cardiorespiratory efficiency when age and

training were controlled, and regular physical training seems to delay the age-related changes in HR max, but not VO_2 max.

4. CORFY, S.M. Injury occurrence among football players of differing levels of flexibility. 1990 (C.B. Corbin)

This research project was undertaken to study the injury occurrence among football players of differing levels of flexibility. Ss included 96 intercollegiate football players, ranging from 18 to 23 yrs of age, who were assessed in their flexibility of 4 major body segments including 26 individual meas. Meas were taken using standard goniometer techniques. These flexibility meas were then compared via Pearson r to determine the relationship between level of flexibility and injury (severity). Correlational anal revealed weak relationships between flexibility and injury. Subsequently "critical levels" of flexibility for each meas were established using flexibility to injury cross tabulations. The relative frequencies of injury among "high" and "low" flexibility Ss were then anal via Chi-square anal to determine their statistical sig. The results revealed sig greater rates among certain "low" flexibility gps. In several cases, excessive flexibility appeared to result in an increase in the relative frequency of injury. Injury occurrence and flexibility level appears to be specific to the joint and motions involved. This study was successful in setting some statistically sig "critical levels" of flexibility. However, it is recommended that future research be aimed at further defining these levels and their relationships to musculoskeletal injury.

5. CREWS, D.L. The influence of attentive states on golf putting as indicated by cardiac and electrocortical activity. Ph.D. in Exercise Science, 1990

Attentive states of elite golfers were examined using EEG and ECG meas during the preshot routine of the golf putt. 2 competing hypotheses attempting to explain the cardiac pattern (acceleration/deceleration) prior to the initiation of the putt were tested. Lacey's intake-rejection hypothesis suggests that the direction (internal/external) of attentional focus determines cardiac pattern while Jennings' capacity hypothesis suggest that it is the amount of limited capacity space utilized which influences the cardiac response. Neither hypothesis was suppoted by the results of this study and an alternative hypothesis was presented. Sensory awareness appears to create a cardiac deceleration pattern while cognitive elaboration elicits cardiac acceleration. This component is discussed as a more viable explanation for cardiac pattern than the intake or rejection of the external environment. Attentive states were also examined with 3 distinct meas of brain activity: slow shift, power frequency, and 40 Hz EEG. All 3 meas show a general reduction in left hemisphere activity and a tendency toward increased right hemisphere EEG as the golfers approached stroke initiation. Each meas expressed an independent concept of cognitive preparation during the preshot routine in both the motor and temporal cortices. The % change of each EEG meas from 3 s preceding the putt to stroke initiation was not related to performance. However, the EEG meas at 1 s prior to the backstroke were related to putts made (decreased left hemisphere activity) and to total cm error (increased right hemisphere activity). These findings were supported by previous studies examining attentive states during rifle shooting, archery, and golf performance. The results were discussed in light of the "let it happen, automatic" type of processing for which athletes continually strive.

6. FITZSIMMONS, P.A.. The effect of performance deception on self-efficacy and maximal performance on a weightlifting task. 1989 (D.M. Landers)

Bandura's theory of self-efficacy proposes that all behavioral change is mediated by the common cognitive mechanism of self-efficacy, which is an individual's belief that he or she can successfully execute the behavior required to produce a certain outcome. Self-efficacy expectations are derived from 4 main sources of information: performance accomplishments, vicarious exp, persuasion, and physiological arousal. This study investigated persuasion as a source of efficacy information by examining the effects of false information fb on self-efficacy beliefs and subsequent weightlifting performance. M Ss (N=36) were randomly assigned to 1 of 3 treatment gps. All Ss engaged in 6, one-rep-max bench press performance sessions. During the performance sessions, Ss were given either accurate performance information or false performance information that they lifted more or less than their actual lift. The first 2 sessions were used as baseline meas. The final 4 sessions involved the performance information manipulation. Before each session, Ss were asked to list the amt of wt they were 100%, 75%, and 50% confident they could lift at that point in time. It was hypothesized that false pos fb would be associated with higher self-efficacy judgments and better performance, and conversely, false neg fb would be associated with lower self-efficacy judgments and poorer performance. Results indicated that false pos fb increased self-efficacy judgments and future performance, but no false neg fb treatment effects were found. Results were discussed in relation to Bandura's theory, attribution theory, and previous research in the area.

7. GANNON, T.L. An analysis of temporal EEG patterning prior to initiation of the arm curl. 1990 (D.M. Landers)

The purpose of the present study was to determine if changes found in EEG activity in the sec prior to response execution in riflery, golf, and archery would extend to a nonspatial task, the arm curl. Temporal EEG and tempomandibular and trapezius EMG meas were taken as Ss ($N=20$) held and lifted submax (25%) and near-max (95%) 1 rep max wts. The degree of attentional focus on the task was quantified through self-report meas after each set of trials. EMG activity between the hold and lift phase for the 2 conditions were nonsig. The degree of attentional focus between phases for both submax and near-max conditions showed sig increases ($p<.01$). Increases in EEG activity for the submax condition were observed between the hold and lift phase at 4 Hz ($p<.003$). This extended to 10 additional frequencies in the near-max condition ($p<.004$), with beta (13 to 30 Hz) activity greater in the right hemisphere ($p<.004$). It was concluded that the changes observed were task specific and appeared to be influenced by the degree of attentional focus and the level of muscular exertion.

8. HEISE, G.D. Interrelationships among mechanical power, energy transfers, and running economy. 1989 (P.E. Martin)

The present investigation determined the interrelationships among aerobic demand and estimates of total body mechanical power output and energy transfer computed with center of mass-, segmental-, and kinetic-based computational approaches at a single speed of running ($3.35\ m.s^{-1}$). 16 well-trained M performed treadmill running for determination of running economy and overground running for which biomechanical meas were determined. Running economy meas exhibited a typical range (i.e.,approx 26%) for runners who possess similar aerobic capacities (i.e., VO_2 max). Overall, the r between mechanical power meas and running economy ranged from poor to moderate ($r=-0.03$ to 0.42). None were statistically sig ($p< 0.05$) and no one approach was clearly superior to another when the r were compared. These results suggest that a more complex modeling scheme is needed when computing mechanical power estimates so that they may account for a greater proportion of variation in aerobic demand. In particular, strain energy contributions and more realistic estimates of muscular contributions to movement are needed in order to estimate metabolic cost more accurately in terms of mechanical power.

9. HIRD, J.S. The effects of various combinations of physical and mental practice on performance. 1990 (D.M. Landers).

Research has shown that combined mental and physical practice in a ratio of 50:50 has stronger performance effects than mental practice, but not as strong as physical practice. However, research has not thoroughly examined the performance effects of varying ratios of combined physical and mental practice. This study compared diff ratios of physical to mental practice on cognitive task (peg board) performance, which requires perceptual and symbolic task elements, as well as motor task (pursuit rotor) performance. There were 72 volunteers (36 M and 36 F) randomly assigned to one of 6 gps: physical practice, 75/25 combined, 50/50 combined, 25/75 combined, mental practice, and motivational-control gps. 7 practice sessions, consisting of four trials/session for the peg board and eight trials/session for the pursuit rotor, were employed; the motivational-control gp practiced on a stabilometer task for the same length of time. ANOVA results showed sig gp x pre-post interactions for both tasks. All treatment conditions improved from the pre- to posttest, except the control gp for the peg board task. The gender x pre-post interaction for the pursuit rotor, and the group x gender interaction for the peg board, were also sig. For the pursuit rotor, M improved from pre- to posttest at a slightly faster rate than F. For the peg board, F performed better than M in all gps except the mental practice and control conditions. There was also a sig gender x session interaction for the peg board, indicating that F improved more than M across sessions. Exp vs. control gp effect size calculations indicated that mental practice was more effective for the peg board than the pursuit rotor, supporting the symbolic learning theory. Also, for the posttest scores of both tasks, as the proportion of physical practice increased, the effect sizes became larger. Sig linear trends of posttest scores were found for both tasks, which showed that as the relative proportion of physical practice was increased, performance was enhanced. These findings indicated that reducing or replacing physical practice with mental practice would be counterproductive, and physical practice should be used as much as possible to most effectively enhance motor performance.

10. HUGHES, R. The metabolic cost of circuit training using gross body movement calisthenics with and without weights. 1990

In this study, the metabolic cost of 2 exercise treatments was examined to evaluate their potential as a mode of aerobic exercise. These treatments were circuits of rhythmical calisthenics, consisting of gross body mvmt to recruit the large muscles of the hips and thighs as well as those of the upper body. The 2 treatments were identical except that one involved the use of handweights and the other did not. This circuit of 10 exercises was practiced on 2 separate days, for 10 and 5 min respectively. The with and without wt treatments were sequenced in a counterbalanced order, with half of the Ss using wts on session 3 and no wts on session 4, while the other half reversed the order of treatments. This controlled for any learning. When measuring the metabolic cost, 3 continuous laps of the 10 exercises were performed, lasting a total of 22.5 min. Ss followed a video demonstration of the exercises on these occasions. The Ss were moderately trained M and F, aged 22.7 to 39.7 yrs (M=29.4 yrs). The M VO_2 max for the gp was 46.1 ml.kg^{-1}.min^{-1} meas on a treadmill using a metabolic cart. HR and VO_2 were meas during the circuit by ECG recordings and the metabolic cart. These values were expressed relative to VO_2 max and to bw. They were 63.6% VO_2 max for the circuit with wt and 64.8% VO_2 max for the circuit without wt. There were no sig diff for either VO_2 or HR relative to max, between the 2 treatment effects using Repeated Meas ANOVA ($p<.05$). It is concluded that this type of exercise raises aerobic metabolism sufficiently to be an effective mode of aerobic conditioning. Since the handweights had no sig effect on the metabolic cost, they are not believed to enhance the aerobic aspect of this circuit. However, they did not reduce the metabolic cost, nor distort HR in any way and may provide additional muscle conditioning. This circuit proved to be easily learned and is a low impact, convenient mode of training. Similar studies with different populations should now be undertaken, along with training studies.

11. LACE, J.E. An isokinetic shoulder profile of collegiate baseball pitchers and its relation to throwing velocity. 1989

The purpose of this study was to determine whether isokinetic strength diff exist between the dominant and nondominant shoulders of coll baseball pitchers. In addition, the relationship between dominant arm isokinetic strength and max throwing velocity was examined. 8 coll baseball pitchers were isokinetically tested on a Cybex II dynamometer integrated with a Discipline RTD data reduction system. Ss were bilaterally tested for shoulder internal/external rotation, flexion/extension, abduction/adduction, and horizontal abduction/adduction. Isokinetic peak torque, total work, and av power data were generated at 90, 210, and 300 deg/sec. 10 max effort fastballs were videotaped with a Panasonic Super-VHS camcorder to determine max throwing velocity. Sig greater ($p<.05$) isokinetic peak torque was found for dominant arm extension. While no other sig diff were found, there were tendencies for increased peak torque in dominant arm internal and external rotation, adduction, horizontal adduction, and nondominant flexion. There was a sig ($p<.10$) relationship between isokinetic strength and max throwing velocity. This study provides a complete isokinetic shoulder strength profile of highly skilled pitchers. The data suggest a tendency for increased isokinetic strength in the dominant shoulder of coll baseball pitchers. These data are useful to the clinician in developing prog of isokinetic rehabilitation and strength conditioning for unilaterally dominant activities involving the shoulder.

12. MCCORMICK, J. A comparison of the basal metabolic rates of trained and untrained women. 1989 (C.L. Wells)

The purpose of this study was to compare absolute and relative basal metabolic rates in relation to body composition and selected dietary and hematological variables in trained and untrained women. 6 trained and 6 untrained Ss completed the protocol. Trained Ss were coll swimmers and cross-country runners from AZ State Univ. Untrained Ss were students and staff from AZ State. Ss were between 18-27 yrs of age, were free of medications, were nondieters, and were experiencing regular menstrual cycles. First, Ss were hydrostatically weighed. On a separate occasion, a blood sample was taken. Ss BMR was meas, using an open circuit method, after an overnight stay in the Exercise and Sport Research Institute at AZ State Univ. There were no sig diff in absolute BMR ($L.min^{-1}$, $kcal.hr^{-1}$). The trained gp had sig higher BMR when expressed in $kcal.kgBW^{-1};hr^{-1}$, but not when expressed in $kcal.kgFFM^{-1}.hr^{-1}$. Ss did not differ sig in the no. of calories consumed per day, percentages of carbohydrates, protein or fat consumed, vitamin C, iron intake, serum ferritin, iron, total bw, or lean body mass. The trained gp was sig lower in % bf, hemoglobin, erythrocyte and hematocrit values than the untrained gp. However, correlation anal failed to show a sig relationship between the 3 hematological variables and BMR expressed in $kcal.kgBW^{-1}.hr^{-1}$. There was no sig diffbetween trained and untrained women when expressed in standard form ($kcal.kgFFM^{-1}.hr^{-1}$). The diff in bf was sig but not unexpected when comparing trained and untrained Ss. Likewise, the sig diff found in HGB, HCT, and RBC were not unusual when using trained Ss and should not have affected BMR. There may be sig diff in more parameters if a larger gp were studied, providing more statistical power. A longer dietary study and a hematological study with several diff blood draws may produce some diff and explain further why athletes had low hemoglobin, hematocrit, and erythrocyte values.

13. MORGAN, C.L. The effects of sodium bicarbonate ingestion on running time to exhaustion and selected physiological parameters. 1990 (C.L. Wells)

It has been theorized that HCO_3- ingestion would enable 10km runners to prolong the time to exhaustion during high intensity treadmill running as a result of increased lactate (LA) efflux from muscle to blood. Data were completed on 6 well-trained M runners who performed 2 treadmill runs to exhaustion at their competitive 10km race pace 30 min after ingesting either 0.3g $HCO_3^-.kg^{-1}$ body mass (E) or flavored H_2O (C). A similar LA response between trials during all phases was found which suggests that LA production was the same during the control and exp trials. M ± SD blood LA pre-ingestion, post-ingestion, min 10, min 20, exhaustion, and 4 min post-exercise were respectively 1.9 ± 0.8, 1.5 ± 0.3, 6.3 ± 1.4, 7.3 ± 2.9, 7.6 ± 3.3, and 6.0 ± 2.8 mM for the E condition, and 1.7 ± 0.3, 1.7 ± 0.7, 7.5 ± 1.7, 8.5 ± 3.4, 8.2 ± 3.5, and 5.8 ± 2.7 mM for the C condition ($P<0.05$ for all time periods). Run time to exhaustion (E=30.7 ± 8.6; C= 27.8 ± 9.6 min), %VO_2 max (E=88.8 ± 5.1; C= 88.8 ± 2.9), VO_2 (E= 56.9 ± 2.6; C= 56.6 ± 2.3 ml.kg^{-1}.min^{-1}), and VCO_2 (E= 3.9 ± 0.4; C= 3.9 ± 0.4 l.min^{-1}) did not diff sig between treatments. The RER (E=0.99 ± 0.02; C= 0.99 ± 0.01, RPE-central (E= 16.5 ± 0.9; C= 16.7 ± 1.3), RPE-peripheral (E= 17.2 ± 0.7; C= 16.9 ± 1.9), and body mass loss (E= 0.97 ± 0.2; C= 0.95 ± 0.5 kg) also showed no sig diff between treatments. The data indicated that HCO_3^- ingestion did not promote LA efflux in 10km runners running at high intensity. Data indicate that HCO_3^- ingestion did not delay fatigue.

14. RIGGS, D.M. The body composition of masters women endurance athletes from 35 to 74 years of age. (C.L. Wells)

73 endurance trained masters F athletes (35-74 yrs of age) were divided into 5 age gps (35-39 yrs, 40-44 yr., 45-49 yrs, 50-54 yrs, 55+ yrs) and assessed for body comp (hydrostatic weighing) and fat distribution. A comparison was made between the runners (n=50) and swimmers (n=23). Anal on the effects of menopause and aging on body comp and fat distribution were performed on the runners alone. Sig diff between runners and swimmers were detected on meas of total body mass, body mass index (BMI), body density, lean body mass (LBM), and % bf ($p<.05$). When age and training were held constant, pre-menopausal, transitional, and post-menopausal gps were not sig diff ($p<.05$) on any body comp or fat distribution variable, except BMI. When training levels were held constant across the 5 age gps, the youngest age gp (35-39 yrs) had lower % bf (21.4%) and higher lean/fat ratio (4.13) than the older athletes ($p<.05$). LBM was maintained across age gps. No diff across age gps were noted in any of the indices of fat distribution ($p<.05$). It was concluded that (1) the runners represented a leaner, smaller boned, and lighter gp of athletes than the swimmers but did not differ on most indices of fat distribution ($p<.05$), which serve as health risk indicators; (2) menopausal states did not have an effect on body comp or fat distribution; and (3) when training was held constant, these masters runners did not differ in LBM, % bf or fat distribution across age. The runners had a low level of peripheral fat relative to central fat, and a low level of upper bf relative to lower bf. Regular endurance training seems to prevent the loss of LBM and increase in % bf associated with aging in the sedentary F population.

15. SAUCY, S.A. The physiological effects of cycling on running performance on triathlete. 1989 (C.L. Wells)

To compare the physiologic responses to running following cycling and to running without prior cycling, 14 triathletes (9 M, 5 F) simulated the bike+run portion of a triathlon by cycling 40 km on an ergometer and running 10 km on a treadmill (TM). Each S cycled at the 4 mM level of blood lactate for a duration equal to his/her ave 40 km bike time. This ride was immediately followed by a run (R_2) at triathlon race pace and duration. Each S also performed a 10 km TM run without prior cycling (R_1). Comparison of R_1 and R_2 demonstrated that no sig diff existed for VO_2, V_E, HR, lactate (Lac), or glucose (GLU). However, the HR at 10 min was sig lower than that at 20 min, 30 min, and run conclusion (F[13] = 16.929, P=0.001) (155±16, 161±14, 162±15, 162±15). No sig diff over time were found for VO_2, V_E, Lac, or GLU. These results demonstrate that triathlon running performance is not adversely affected by prior cycling, suggesting that the fitness level and rigorous training of triathletes enables them to adapt to running immediately following cycling.

16. ZAMIRZA, A.A. The effect of exercise training on menstrual function: A quantitative review. 1989 (C.L. Wells)

Increased participation of women in intense physical training has resulted in a concomitant rise in athletic menstrual irregularities (AMI). To investigate exercise-associated amenorrhea, statistical methods were used to anal data from 29 studies. Highly trained amenorrheic athletes were compared with eumenorrheic athletes. 10 hormones including luteinizing hormone (LH), follicle stimulating hormone (FSH), estradiol (E_2), progesterone (P_4), prolactin (PRL), testosterone (T), cortisol (F), and estrone (E_1) were anal. Comparisons between means indicated that CA, age at menarche, gynecological age, no. of hrs per wk in training, and training pace did not diff between the 2 gps. The 2 gps diff in wt and body mass index (BMI). Amenorrheic athletes were lighter, and lower in BMI compared with the eumenorrheic athletes. No diff were found in LH, FSH, E_2, PRL, T, and E_1 basal levels, as well as the baseline ratios LH/FSH and E_1/E_2 between eumenorrheic athletes in follicular phase and amenorrheic athletes. Eumenorrheic athletes in the luteal phase had higher E_2 levels than the amenorrheic athletes. In response to acute exercise, E_2 increased in both gps while PRL did not. The relative increase in E_2 levels after exercise did not diff between the 2 gps. Thus, it appears that the sensitivity to exercise stimulus did not diff between the 2 gps with respect to these 2 hormones. Consistent with previous hypotheses, this study provides evidence that the reproductive hormone estradiol is suppressed in amenorrheic athletes and that low bw for ht is a major factor associated with amenorrhea. Contradictory to previous hypotheses, this study did not find suppressed gonadotropins, nor PRL in amenorrheic athletes compared with cyclic athletes. Training parameters alone are unlikely to have triggered cessation of menstrual cycle in highly trained athletes. Secondary amenorrhea is not a direct result of exercise. Thus, strenuous conditioning prog in F athletes are not contraindicated by these results. Though no causal explanation can be offered, the results indicate that the approach to treating AMI may be best directed toward the proper maintenance of bw.

17. ZOMBRO, J.K Effects of experience and feedback on female self-confidence and intrinsic motivation in physical activity. 1990 (C.B. Corbin)

There has been considerable research in the past decade concerning diff in self-confidence and motivation levels between M and F. It was of interest in the current study to determine if exp and KR had an effect on F self-confidence and intrinsic motivation. The purpose of this investigation was to study the self-confidence and intrinsic motivation of high and low-exp F following performance on a gender-neutral motor task in a noncomparative environment, in which KR was either present or not present. The study was conducted by grouping Ss as either high-exp (n=32) or low-exp (n=32) based on their responses to a questionnaire. Half of the high-exp gp (n=16) and half of the low-exp gp (n=16) received KR after each trial. Half of the high-exp gp (n=16) and half of the low-exp gp received no fb. All Ss performed the task for 3 trials. Results indicated a sig diff between high and low-exp F on a global meas of self-confidence in which they rated their overall performance. No sig diff were found between the KR gps and the no-KR gps. No sig main or interaction effects were found for either exp level or KR relative to intrinsic motivation. Results of the study support the contention that exp influences the self-confidence of F concerning physical activity. However, KR, in this study, did not influence either self-confidence or intrinsic motivation. Likewise, exp was not an influential factor for intrinsic motivation as it was for self-confidence

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18. BEARD, G.C. The effect of carbonated solutions on gastric emptying during prolonged cycling. MA in Physical Education, 1990, 67 pp. (D.L. Costill)

The purpose of this investigation was to determine the effect of solute carbonation and carbohydrate (CHO) concentration on gastric emptying during prolonged cycling. 8 highly trained M cyclists completed 4 two hr cycling bouts during which one of 4 test solutions was consumed. The test solutions consisted of a carbonated 10% CHO solution (CK), a noncarbonated 10% CHO solution (NCK), a carbonated non-CHO solution (CNK), and a noncarbonated non-CHO solution (NCNK). Approximately 150 ml (8.5 ml/kg/hr) of one of the test solutions were consumed every 15 min. The first 105 min of each trial was a continuous ride on an electrically braked cycle ergometer at 70% of VO2 max. The last 15 min of each trial was a self-paced "performance ride" on an isokinetic cycle ergometer. The Ss were instructed to complete as much work (kilojuoles) as possible during the performance ride. Gastric contents were aspirated within 5 min following the performance ride and anal to determine the amount of the original test solution emptied. Of the original 1273 ml ingested during each trial, the vol emptied were 993.6 ± 78.1, 1064.6 ±75.3, 1097.4 ± 94.2, and 1147.2 ± 95.9 ml (±SE) for CK, NCK, CNK, NCNK, respectively. The only sig diff was between trials CK and NCNK ($p<0.05$). There were no statistically sig diff in total work output between any of the trials. However, when the performance data from the CHO trials were pooled and compared to the combined data from the non-CHO trials, total work output was sig greater ($p<0.05$) in the CHO gp (1185.19 ± 21.81, and 1092.85 ± 21.52 Kj [± SE] for the CHO and non-CHO gps, respectively). These data suggest that carbonated or 10% CHO solutions, independent of one another, may not sig inhibit gastric emptying. They also suggest that there may be some interaction between carbonation and CHO concentration which caused an additional inhibition of emptying. In addition, the potential for improved performance exists with the consumption of 10% CHO solutions.

19. BENEDICT, M.A. Reliability in the measurement of muscle fiber composition and the histochemical staining for glycogen. MA in Physical Education, 1990, 93 pp. (D.L. Costill)

This study was conducted to determine the variation in stain intensity between serial sections of muscle biopsies following a periodic acid Schiff (PAS) staining procedure, to assess the reliability of the PAS staining technique for the quantitation of the glycogen content in muscle fibers, and to eval the variability in fiber comp between repeated biopsies of the vastus lateralis (VL) muscle. 8 randomly located biopsies (4 right leg and 4 left leg) were obtained from the VL of each of 16 healthy M (26.1 ± 1.1 yrs.) Serial cross sections, 10 um thick, were cut from each biopsy and stained for myosin ATPase following an acid preincubation at pH=4.30 and for glycogen using a PAS staining procedure. No sig diff existed in the fiber composition between the 8 repeated biopsies taken from an individual. The variation in type I fiber %, expressed as the coefficient of variation, between repeated biopsies of the same leg and between the right and left VL ave 18.6% and 17.7%, respectively. In many cases, diff of greater than 20% in the % of type I fibers were observed between repeated samples. These data suggest an inhomogeneity with regard to the fiber type distribution in the VL of young M and an inability to predict the fiber composition of a muscle with a single biopsy sample. The optical densities (OD) of the same 50 type I and 50 type II fibers were determined in each of 3 PAS stained serial sections per biopsy using a computer integrated photometric system. M total, fiber type specific, and individual fiber OD did not diff sig between the serial sections although a variability was observed. This variability appears to be primarily due to diff in sectional thickness. The comparison of biochemically determined glycogen content (41.0 - 191.0 mmol.kg^{-1}wet wt) to M total OD in sections from the same samples resulted in a poor relationship (r=0.47) between the two methods for the quantification of muscle glycogen. These results indicate a variability in PAS stain intensity between serial sections of muscle biopsies and an inability to quantify muscle glycogen concentrations with the photometric determination of OD of the PAS stain in cross sections of muscle.

20. HE, Q. Evaluation of stretch load capacity and utilization of stored elastic energy in leg extensor muscles during vertical jumps. MA in Physical Education, 1989.

An alternating cycle of neg-pos work phases in the lower legs during vertical jumps represents a sequence where storage and utilization of elastic energy takes place. It is possible that energy storage and its utilization depend on the stretch load capacity of activated muscles in legs. It is also possible that there may be a diff between trained and untrained Ss in stretch load capacity To investigate these assumed diff and to evaluate the leg stretch load capacity, 14 M Ss were assigned to either a trained (N=7) or untrained (N=7) gp. All Ss performed 2 vertical jumps, drop jump and counter-mvmt jump, at 4 diff hts (20, 35, 50, and 65 cm). A Locam 16 mm high speed camera was used to film all mvmts during 2 vertical jump tests. A sonic digitizer interfaced to VAX was used to digitize the film data in this study. As expected, the mechanical work, vertical force, and vertical velocity during landing phase increased with the increase of dropping ht for both of the gps. But, these selected biomechanical variables, including pos work, force, kinetic energy, and jumping performance, during take-off phase for trained Ss increased when dropping ht was increased from 20 to 50 cm, and then decreased when dropping ht increased up to 65 cm; for untrained Ss, increased when dropping ht increased from 20 to 35 cm, and then decreased when dropping ht up to 50 or 65 cm. In counter-mvmt test, the mechanical energy output during pos phase increased with increase of jumped hts. The results of present study revealed that the main effects of drop jump as one of the most popular plyometric drills to influence jumping performance are sig.

21. KWAK, E.C. An analysis of pass-set-attack sequences for in-class game play and after-class game play in volleyball. MA in Physical Education, 1990, 24 pp. (M. Buck)

This study investigated the relationship between pass-set-attack sequences to the total n of sequence opportunities ratios for in-class game play and after-class game play in volleyball. Univ students enrolled in 2 co-ed beginning volleyball classes were used for this study. Each game was videotaped and then anal using the n of pass-set-attack sequences to total opportunities. A t-test was used to determine if a diff existed between both in-class and after-class games. The result of this study indicated that when both in-class game play and after-class game play were anal by total pass-set-attack sequences to total sequence opportunities ratios, after-class game play produced more pass-set-attack sequences than in-class game play. This study led me to conclude that offensive and defensive strategies should be kept as simple as possible until skills can be used appropriately and consistently in game play situations.

22. LAMBERT, C.P. Fluid replacement after exercise in the heat: Influence of beverage carbonation and carbohydrate content. MA in Physical Education, 1990, 100 pp. (D.L. Costill)

This investigation evaluated the influence of beverage carbonation and carbohydrate content on fluid replacement following exercise/thermal dehydration. 8 recreationally trained M cycled at 50% of their max aerobic power in a hot environment (40° C 40% relative humidity) until a bw loss of 4.12 ± 0.02% was attained. In the subsequent 4 hrs, Ss ingested one of 4 randomly assigned solutions at 15 min intervals. The total vol ingested equalled that lost during dehydration. The solutions varied in their carbohydrate and carbonation content as follows: 1) CK: carbonated 10% carbohydrate solution,. 2) NCK: noncarbonated 10% carbohydrate solution, 3) CNK: carbonated noncaloric solution, and 4) NCNK: noncarbonated noncaloric solution. Before dehydration and at 0, 60, 120, 180, and 240 min of recovery Ss performed a 5 min cycling bout (SCB) at 70% of their max aerobic power. In addition, resting venous blood samples were obtained before and after dehydration, and at 30, 90, 150, and 240 min of recovery. Rehydration evaluated from bw, plasma vol, plasma protein, and urine vol data was not sig ($p > 0.05$) diff between treatments at any time. In addition, carbonated beverage (CK and CNK) ingestion did not sig alter the pCO_2 or pH of venous blood at rest or the respiratory exchange ratio (RER) during exercise; however, the ingestion of carbohydrate beverages (CK and NCK) elevated the RER during the SCB relative to the level elicited by ingestion of noncarbohydrate beverages. VO_2 during the SCB at 240 min was sig ($p< 0.05$) higher in the noncarbohydrate treatments (NCNK vs CK and CNK and NCNK vs NCK); however, no diff in caloric expenditure were observed. Arterialized blood lactate 1 min after each SCB was not diff between treatments. Lactate levels were sig higher, however, when data from the carbohydrate treatments were pooled and compared to the noncarbohydrate treatments. No sig diff were observed in RPE or ratings of gastrointestinal comfort. The results of this investigation suggest that solutions which are carbonated and/or contain a carbohydrate concentration of 10% are as effective as noncarbonated and/or noncarbohydrate solutions with regard to fluid replacement. In addition, the ingestion of carbonated beverages does not appear to be associated with alterations in the pCO_2 or pH of venous blood or gastric distress relative to the levels attained with noncarbonated beverages.

23. LAMBERT, G.P. The relationship between physiological measurements and cross-country running performance. MA in Physical Education, 1990, 78 pp. (D.L. Costill)

7 highly trained M coll distance runners were studied throughout a competitive cross-country season. Common laboratory and field meas were used to assess physiological adaptation and performance capacity. The Ss were tested pre-, mid-, and post-season for VO_2 max, running economy (RE), HR at 268 m-min-l (HR 268), fractional utilization of the aerobic capacity (% VO_2 max), fractional utilization of the max HR (% HR max), ventilatory threshold (VT), and time to exhaustion (TTE). Prior to each scheduled competition submax HR and submax blood lactate accumulation (bLa) were determined from a one-mile run on an indoor track. 5 Ss ran at 5 min 30 sec per mile pace and 2 ran at a 6 min per mile pace (M intensity = 83.14 +/-4.44% VO_2 max). VO_2 max, RE, % VO_2 max and TTE all sig improved over the season ($p < 0.05$). VT and HR268 remained unchanged. % VO_2 max and % HRmax exhibited the highest r to performance within a given competition (range r = .525 to .722 and .571 to .844 respectively). HR and bLa did not change during the season. These results suggest: 1) % VO_2 max and % HR max are the best predictors of cross-country running performance among the variables meas, whereas 2) field trials employing single HR and single bLa meas are not valid indicators of endurance running performance in highly trained distance runners.

24. SHI, X. Effect of sodium and water intake on plasma aldosterone during prolongerd exercise in warm environment. MA in Physical Education, 1990, 55 pp. D.L. Costill)

8 well-trained M and F cyclists were studied to determine the effect of sodium and/ or water intake on plasma aldosterone during 6 hrs of cycling (55% VO_2 max) in a warm environment (Tdb = 35° C WBGT = 30° C). Each S randomly completed 3 trials (water = W; saline = S, and no fluid = NF) at 1 wk interval. Venous blood samples were obtained before dehydration, at 2 ,4, 5, and 6 hrs during exercise, and also after dehydration. Plasma samples were anal for hemoglobin, sodium, potassium, aldosterone and osmolality. Sweat and urine samples were also collected and anal for sodium content. Plasma volume based on hemoglobin decreased sig ($p<0.01$) at 15 min in all 3 trials (Trial W = -7.6% ± 1.12%; Trial S = -8.6% ± 1.42%; Trial NF = - 6.7% ± 0.88%) and continued to decrease sig in Trial NF during exercise (-10.99% ± 1.3% at the 2nd hr; -15.5% ± 1.3% at the 4th hr; -16.8% ± 1.32% at the 5th hr). No sig diff were found between trials. Plasma sodium concentration [Na+] decreased over time in Trials W and S and increased in Trial NF due to plasma volume loss. Sig diff in [Na+] were found between Trial NF and Trials W or S. Plasma sodium [Na+] adjusted by plasma volume change decreased sig at 2 hrs ($p <0.01$) in the 3 trials. Av total sodium content of plasma decreased by 125.9 mEq during Trial S, 223.1 mEq during Trial W and 147.1 mEq during Trial NF. Plasma potassium increased sig ($p<0.01$) at 2 hrs in all 3 trials. Plasma osmolality increased sig ($p< 0.01$) during prolonged exercise (Trial W = 287.1 ± 2.4 mEq/l; Trial S = 289.4 ± 1.17 mEq/l and Trial NF = 306 ± 1.6 mEq/ l). No sig diff were found between Trials W and S although osmolality was lower in Trial W than in Trial S. A sig diff in osmolality was obtained between Trial NF and Trials W and S ($p< 0.01$). Plasma aldosterone increased sig ($p < 0.01$) during exercise and decreased after exercise. No sig diff existed between Trials W and S although aldosterone levels were lower in Trial S than in Trial W. However, a sig diff was found between Trial NF and Trials W or S. The results of this study suggest that plasma aldosterone has an inverse relationship with plasma vol changes and total sodium concentrations. An increase in plasma potassium and a decrease in plasma sodium during prolonged exercise in a warm environment sig enhanced plasma aldosterone concentration. The intake of water sig decreased plasma aldosterone during prolonged exercise in a warm environment, but the intake of sodium had no sig effect in this study.

25. THIBODEAU, L. Comparison of androgyny levels in team and individual sport female athletes. MA in Physical Education, 1990

The purpose of this study was to compare the androgyny level of Division 1 coll F athletes participating in team and individual sports. Androgyny was meas by the Bem Sex Role Inventory (BSRI). Participating team sports included field hockey, BB, and softball, while individual sports included swimming, gymnastics, and track and field. The inventory was admin to a total of 100 Ss. Results were obtained by using the femininity and masculinity raw scores in a chi square anal. The data were subjected to 3 separate chi square anal, all at the $p<.05$ level of sig. Only 3 sports, track and field, gymnastics, and field hockey, had a majority (over 50%) of athletes rate androgyny as meas by the BSRI. There was no sig diff found between the groupings of team and individual sport F athletes on the trait of androgyny.

26. WILKERSON, B.A. The effects of size and weight on basketball free throw performance: A biomechanical analysis of unskilled college women. MA in Physical Education, 1989

The purpose of this study was to determine the effects of 2 diff sizes and wts of basketballs on free throw shooting performance of unskilled F. The Ss (n=8) were unskilled F, selected from Ball State Univ's PE classes. A biomechanical anal procedure of the angle of projectile, velocity of projection, vertical displacement of mass and ball center, and velocity of center of mass, all at release was employed. Ss were filmed with a 16mm camera (64f/s) while taking the AAHPER Foul Shot Basketball Skills Test. The film was anal with the aid of a digitizer interface VAX computer. 23 points were digitized for each S. The free throw shooting percentage for the smaller ball was 17.5% and 21.2% with the regulation basketball. The angles of the right and left hand, wrist, elbow, lower and upper arms were not found to be sig diff between exp conditions. The findings suggest that the diff sizes and wts of basketballs have no sig effect on the angles of projectile, velocity of projection, vertical displacement of mass and ball center, and velocity of center of mass at release involved in the free throw shooting of unskilled coll F. Statistical anal of foul shot ability indicated no sig diff between wt and size of basketballs.

27. YOO, H.S. Relationship between playing position in football and selected psychological variables. MA in Physical Education, 1989

The purpose of this investigation was to study the relationship between selected psych variables and playing position of football players. Ss were 43 Division 1 intercoll football players. The athletes were categorized as a function of team (offense vs defense) and position (linemen vs. backfield). Data were anal using MANOVA and follow-up ANOVA procedures. In the first anal, team and playing positions were studied relative to psych skill as meas by the Psychological Skills Inventory for Sports (PSIS) (Mahoney, Gabriel, and Perkins, 1987). In the second anal, team and player position were studied relative to mood states as meas by the Profile of Mood States (POMS) (McNair, Lorr, and Droppleman, 1981). The MANOVA for psych skills revealed a sig player position main effect ($p=.018$) and a sig interaction between team (offense vs. defense) and player position (linemen vs. backfield). Univariate posthoc comparisons revealed least sig diff (LSD) between offensive linemen and offensive backfield players on the psych dimensions of anxiety and motivation and between defensive linemen and defensive backfield players on anxiety, concentration, and confidence, favoring the backfield position. In addition, the offensive backfield players were observed to enjoy superior confidence scores when compared with defensive linemen. In general, the psych skills of backfield players were observed to be superior to linemen, regardless of whether they played offense or defense. The MANOVA on mood states failed to reveal sig diff for the main effect of team, position, or their interaction. Univariate comparisons (LSD) revealed sig diff between linemen and backfield players on the mood state of confusion, favoring backfield players

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28. CLARKE, J.R. An estimated residual volume: Influence on the measurement of body density by the hydrostatic weighing technique. MA in Physical Education, 1988

It is common practice to estimate RV used for hydrostatic weighing as 24% of a measured vital capacity (VC) for healthy M. This study examined the effects of an estimated and meas RV on body density and relative bf content for 21 healthy, nonsmoking M 19-33 yrs of age. RV and VC were meas using the helium dilution technique and spirometry, respectively. Also, each S underwent hydrostatic weighing. The M (± SD) meas RV/VC ratio was 0.234 (±0.032), which was not sig diff from 0.24. The estimated RV caused small, nonsig errors in the calculation of body density and relative bf content. Hence, a constant value for the RV/VC ratio provides an accurate enough estimate of the RV for use in the calculation of body density determined from hydrostatic weighing. These results are specific to age and gender for the Ss of this study.

29. CLINE, J.M. Effect of land and water exercise on hip and knee flexibility in female osteoarthritic elderly. MA in Physical Education, 1989

To determine effects of land and water exercise on flexibility in osteoarthritic elderly F, 2 exp gps performed similar Arthritis Foundation exercise programs on land or water over an 8 wk period. A control gp was not involved in either exercise program. 39 Ss, selected from intact senior center clusters, were matched between gps for age and type of arthritis, and pre- and post-tested for right hip and knee flexibility utilizing goniometer meas for active and passive ROM. Results indicated sig (.05) flexibility increases in both exercise gps, but not in the control gp. Sig diff in flexibility were also found between land and water exercise programs. Active and passive ROM for right knee flexion increased in the land exercise gp; active ROM for right knee extension increased in the water exercise gp.

30. CORREA-GONZALEZ, D.L. For the welfare of the participant: Women's intercollegiate athletic administration at California State University, Long Beach, 1950-1975. MA in Physical Education, 1988

The admin of the women's intercoll athletic program at CA State Univ, Long Beach, from 1950 to 1975 was anal for the ways in which it reflected dominant American social forces, such as women's role in society and national objectives of educ, as well as local and personal factors. Private collections, personal interviews, and newspapers were used to document the women's prog. The athletic prog was found to reflect the changing position of women in society. Educ objectives were emphasized by the admin. Regional and personal factors created a situation which encouraged faster development of women's intercoll athletics at CA State Univ, Long Beach, than in other regions of the country. Diff in strategy used by the women for obtaining greater equality for the athletic prog mirrored the diff in the feminist mvmt regarding the best way to achieve equality for women.

31. DRAKOPOULOU, G. Sport and physical education in pre-revolutionary and post-revolutionary Cuba. MA in Physical Education, 1989

The impressive performances of Cuba in the international sports arena during the last 2 decades provide the justification for a deeper investigation into the Cuban sports structure. The purpose of this thesis is to demonstrate that the change in sport in Cuba after the Revolution has been a direct result of the political and socioeconomic change. Data were assembled both from the pre-revolutionary and the post-revolutionary period in order for a historical comparison to be conducted. The place of sport in the modern Cuban society, as well as the grounds for the Cuban government's emphasis on sport, were also examined.

32. HANSON, C.A. The effectiveness of the "Data, Research, Strategy Coding Instrument" for use by supervisors in postobservation student teaching conferences. MA in Physical Education, 1989

A student teacher and student behavior coding instrument to help supervisors provide appropriate and detailed fb during postobservation conferences with student teachers was developed, and its effectiveness was determined. A preliminary inventory of appropriate behaviors and their definitions was compiled and then reviewed by experts to establish content validity. The review indicated key behaviors. Key behaviors were grouped into categories of data, research, and strategy and incorporated into the "Data, Research, Strategy Coding Instrument" (DRSCI). In addition, several postobservation student teaching conferences with supervisors who had not used the DRSCI were audiotaped. During playback, supervisor fb was coded by 2 independent raters utilizing the DRSCI to examine the instrument's reliability. Interobserver agreement was 90%. The DRSCI was found to be easy to understand and use. Results of DRSCI coding revealed an appreciable lack of appropriate and detailed supervisor fb. The DRSCI may help supervisors and personnel departments provide such fb.

33. JESKE, X.I.R. The effects of running or walking on children 7-9 years of age. MA in Physical Education, 1988

The purpose of this study was to determine the effects of walking or running on 52 children, 7-9 yrs of age. The children wre divided by chance into 3 gps. Gp I trained 2 days per wk; Gp II, 3 days per wk; and Gp III, 4 days per wk. The children were asked to run or at least jog at a challenging pace. Skinfolds, bw, resting HR, and resting BP were determined before and after the 4 wks of training The results of this study indicated that all 3 gps sig reduced their bf. Gp I showed a statistically sig increase in resting estimated M BP. There were no other statistically sig findings.

34. LAUX, W.E. An oral history of the influence of Paul Petzoldt on the development of Outward Bound, the National Outdoor Leadership School and the Wilderness Education Association. MA in Physical Education, 1988

An oral history of Paul Petzoldt and his influence on the formation and dev of Outward

Bound, the National Outdoor Leadership School, and the Wilderness Education Association were explored. The data collected for the study included 3 tape recorded interviews with Paul Petzoldt in addition to a review of lit on his life and accomplishments. This study concerned the Petzoldt philosophy of outdoor educ, conservation, judgment-leadership principles, and certification of individuals' knowledge of "the wild outdoors."

35. MAIER, K.R. Gender trends in the employment and assignment of coaches and athletic directors in the "California Interscholastic Federation—Southern Section" 1975-1989. MA in Physical Education, 1989

The purpose of this study was to determine gender trends in the employment and assignment of leadership positions (coaches and ADs) of girls' interscholastic sports in the CA Interscholastic Federation—Southern Section (CIF-SS) for the years 1975-76, 1980-81, 1985-86, and 1988-89 The CIF-SS Blue Book was used to determine gender. Throughout the lit, it has been reported that women represented 90% or more of the girls sports leadership positions prior to Title IX. The results of this study indicated that, between the school years 1975-76 and 1988-89, the no. of girls' sports leadership positions increased almost 50%; while the no. of F holding those positions had decreased over 50%. In the CIF-SS during 1975-76, 85.8% of the girls' sports leadership positions were held by women. During the 1988-89 school year, F representation declined to 35.5%.

36. MCMORROW, P.A. The effect of body position on uphill bicycle racing. MA in Physical Education, 1988

The purpose of this study was to determine what effect body position had on uphill bicycle racing times. 17 Ss, 6 F and 11 M, were tested on a hill 3.4 km long with a M grade of 4.6% (range -1.0 to 11.0). Each of the Ss rode max up the hill. 3 diff modes of riding up the hill were observed. The modes were habitual riding, sitting, and standing. This study was double blind with regard to the times of the trials. The results indicated no statistically sig diff among the 3 riding modes for time, work rate, total riding wt, and bf. This study fails to explain why such disparate racing positions do not result in sig diff performances while racing uphill.

37. MORI, C.A. Women's participation in the 1928 and 1932 Olympic Games as examplified by the life of Margaret Jenkins. MA in Physical Education, 1989

The purpose of this study was to investigate the participation of an American woman, Margaret Jenkins, a discus thrower in the 1928 and 1932 Olympic Games, and to assemble a descriptive historical document on her competitive exp. Additionally, the investigator identified the forces which influenced and shaped the women's participation in the 1932 Olympic Games. Methods used during this investigation included tape interviews with the S, Margaret Jenkins, along with a search of timely newspapers, journals, books, and articles. This study revealed the forces which helped shape and influence women's paticipation in general and Margaret Jenkins' specifically in the 1928 and 1932 Olympic Games. The surge of women's participation in sport today is due greatly to the breaking of barriers by sportswomen of yesterday.

38. NAVARRO, S.J. Performance of competitive cyclists racing uphill in the standard racing condition versus the racing condition without toe clips. MA in Physical Education, 1988

The purpose of this study was to compare the uphill performance of cyclists in standard racing condition versus racing condition without toe clips. 16 cyclists volunteered to participate. The uphill course was 2.15 miles long, with a M grade of 4.4%. M trial times for men and women were 9.0016 ± 1.0456 min (± SD) for standard racing condition and 9.4700 ± 1.1901 min for racing condition without toe clips ($p < 0.01$). For women, M trial times were 9.6590 ± 1.1688 min for standard racing condition and 10.2078 ± 1.3746 min for racing condition without toe clips ($p < 0.10$). For men, M trial times were 8.6000 ± 0.9641 min for standard racing condition and 9.0274 ± 0.9978 min for racing condition without toe clips ($p < 0.05$). It is concluded that racing uphill in standard racing condition is superior to racing condition without toe clips.

39. PESTOLESI, T.J. Selected training programs to improve vertical jump in high school athletes. MA in Physical Education, 1989

The purpose of this study was to determine if selected training methods would lead to increased vertical jump performance in HS athletes. 33 volunteer athletes, ages 14 to 18, were randomly placed in 3 gps. Gp 1 trained with wts; Gp 2 did jump training; and Gp 3, the control gp, was to continue participating in the regular PE classes only. Excellent facilities at the HS where the study took place were made available 3 times a wk by the athletic dept. The student athletes trained under the direct supervision of the researcher. The findings showed there was a slight increase in vertical jump in Gps 1 and 2. There was almost no change in vertical jump in Gp 3, and several Ss actually tested at a lower level in some categories.

40. SEARS, C.M. Contextual interference effects as a function of age. MA in Physical Education, 1988

Based on Battig's (1972) conceptualization that increased CI during skill acquisition can lead to improved retention, this study investigated CI as a function of age. 12 students each from ELE school, junior HS, HS, and coll learned 3 motor skill tasks under a blocked (low interference) or random (high interference) sequence of presentation and were tested for retention. Results revealed CI effects for RT at the ELE, junior HS, and coll levels and for MT at the coll level. In general, CI effects did appear in the random presentation gp and not the block presentation gp. The results indicated CI does interact across ages. Several alternative explanations were postulated to account for the findings, such as maturation, mental capacity, and exp of the S.

41. TERRY, C. A comparison of two helium dilution techniques for the determination of functional residual capacity. MA in Physical Education, 1989

Functional residual capacity (FRC) is typically meas by a gas dilution technique or body plethysmography. Some investigators have meas larger FRC values by plethysmography than by dilutional techniques. A controversy exists as to whether a modified helium dilution technique (HDT) gives the same or larger (similar to plethysmography) values than the standard HDT. This study meas FRC using a standard HDT and a modified procedure that included 5 deep breaths designed to ventilate all lung regions; some lung regions may be poorly ventilated during the standard (tidal-breathing) HDT. The M (±SD) of the duplicate standard and modified tests were 3.923 (±0.703) and 3.943 (±0.654) liters, BTPS, respectively. A paired t test demonstrated no sig diff between methods. Thus, a modified HDT does not appear to give larger FRC values than a standard HDT. Furthermore, a standard HDT does not appear to underestimate true FRC in young, healthy men.

42. WILLIAMS, E.W. Academic learning time of preservice physical education teachers during a preliminary field experience. MA in Physical Education, 1989

The purpose of this study was to determine the percentage of teacher and student behaviors accumulated in ELE school PE classes taught by entry level preservice PE majors. 12 student teachers were videotaped (25 observations) over a period of 2 semesters. A computerized version of the Academic Learning Time—Physical Education—Teacher Behavior observation coding instrument was used to meas teacher and student behavior. Data presentation is in the form of M and range percentages for all, F, M, team sport, and individual activity observations. Findings on student engagement indicated 76.89% of class time was spent on nonmotor engaged behaviors, and 20.10% on ALT-PE.

43. WOOD, D.A. The effect of progressive endurance training on body fat and water loss in women. MA in Physical Education, 1989

Previous research suggests that training at exercise intensities high enough to increase VO_2 max causes an increase in acute water loss and a decrease in bf over the course of the training period. In this study, 10 adult women were given a progressive aerobic training prog starting with a load of .25 kg and increasing this load absolutely .25 kg each wk for 7 consecutive wks. The Ss rode bicycle ergometers for 30 min a day, 5 days per wk for 8 wks in a health club. The results showed no sig increase in acute water loss nor in VO_2 max. The M fat loss was sig diff. This study suggests that exercising at low to moderate intensities over an 8 wk training period may sig decrease bf without sig increasing acute water loss or VO_2 max.

44. WRIGHT, L.E. The acute effects of music and stretching upon hyperactivity and on-task behavior in emotionally disturbed children. MA in Physical Education, 1988

This study investigated the acute effects of 3 diff techniques admin to emotionally disturbed children with attention deficit disorder/hyperactivity during the 5-min cool-down period at the end of a PE class The 3 treatments were instrumental music listening, stretching, and stretching in conjunction with instrumental music listening. 12 students were videotaped 8 times per treatment and rated by 2 teachers for hyperactivity and on-task behavior using the Conners Abbreviated Teacher's Rating Scale and an Observation Anal Checklist, respectively. Results indicated that, in comparison with the baseline, all 3 treatments had a sig effect on both the degree of hyperactivity and on-task behavior, with music and stretching evidencing an additive effect for hyperactivity but not on-task behavior. No sig diff were found between age gps. It was concluded that music and stretching can be effective tools for managing hyperactivity after physical exercise.

45. WRYNN, A.M. Women's industrial and recreation league softball in southern California 1930-1950. MA in Physical Education, 1989

Women's rec league softball is not a recent innovation. Women have been competing against one another for more than 50 yrs. The opportunities for participation that were afforded to women during the 1930s and 1940s were linked to their employment opportunities. Participation levels of nonminority women reached a peak during 1944 in the Long Beach rec league. Minority women, which included black women and Japanese women, also competed in rec softball during these years. They had their own leagues, as reported in Rafu Shimpo for Japanese women and the California Eagle for black women, and their participation was also influenced by outside societal forces. The coverage of nonminority women in the Long Beach Press Telegram fluctuated through the years, reaching a peak in 1945, just before the end of the war.

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46. CEBRICK, J.A. Excess postexercise oxygen consumption following a submaximal run and a submaximal swim in females. MA in Exercise Science, 1990

This study examined the postexercise metabolic effects of a 30-min submax treadmill run which was performed at an ave of 72% of the Ss max HR and a 30-min submax free-swim which was performed at an ave of 82% of each individual's max HR. 6 healthy F between the ages of 21 and 28 yrs volunteered as Ss for this study. The criteria for S selection included being a nonsmoker, having no documented history of CV disease, and being classified as a moderately trained rec athlete (i.e., triathletes and/or road racers). Resting metabolic rates (RMR) were determined in the morning prior to each submax exercise test, which was within 1 hr after the Ss had awakened. Metabolic meas of VO2, carbon dioxide production (VCO2), VE, HR, and rectal temp (TREC), were meas during each min of the 30-min run. Throughout the 30-min free-swim, only HR was determined. Rectal temp were obtained prior to and following the 30-min free-swim. Immediately following each submax exercise test, VO2, VE, HR, and TREC were meas for the first 60 min and again for 10 min at 4, 6, and 24 hrs postexercise. The results of this study indicated that the effects of the 30-min submax free-swim on VO2, VE, and HR caused sig increases ($p \leq 0.05$) in excess postexercise VO2 (EPOC), when compared to values obtained following the submax run. HR was sig higher ($p \leq 0.05$) throughout the submax 30-min free-swim, which resulted in a greater intensity of exercise during the submax swim that may have contributed to elevated V)2 immediately following exercise for the first 9 min and at 24 hrs postexercise. Rectal temp were sig elevated ($p \leq 0.05$) immediately following the submax run when compared to the swim but did not appear to have any effect of EPOC or HR parameters; therefore, the results seemed to indicate that workload intensity plays a greater role than an increased core temp in maintaining elevated metabolic levels.

47. HARMS, C.A. Influence of body fat mass on excess post-exercise oxygen consumption. MSc in Physical Education, 1990

Few studies have dealt specifically with the influence of bf mass relative to excess post-exercise O_2 consumption (EPOC). This study matched S's lean bw while % bf were kept sig ($p \leq .05$) diff. 2 gps of 8 healthy M between the ages of 18 and 22 yrs volunteered as Ss for this study. The criteria for S selection required all Ss to have a lean body mass of 65-70 kg. Additionally, a lean and nonlean gp were required to have %bf of $\leq 10\%$ and $\geq 17\%$ respectively. Metabolic meas for VO_2, VCO_2, V_E, respiratory exchange ratio (RER), and core body temp (T_{REC}) were meas during each min for max exercise, resting metabolic rates (RMR), submax exercise, and for one hr postexercise. A 20-min submax treadmill run was performed at an ave of 73.0% VO_{2max} for the lean gp and 73.3% VO_{2max} for the nonlean gp. Following the submax run, the lean gp displayed greater ($P \leq .05$) VO_2 ($ml.kg^{-1}.min^{-1}$) for recovery min 0-30 than the nonlean gp. RER was lower ($p \leq .05$) for the lean gp for min 21-60 post-exercise which perhaps indicated greater fatty acid utilization. The lean gp dissipated body heat (T_{REC}) more rapidly than the nonlean gp and remained cooler ($p \leq .05$) for min 21-60 post-exercise. Decreased core body temp for the lean gp suggests increased ($p \leq .05$) fatty acid utilization during recovery or perhaps less body fat to retard thermoescape. These data suggest that individuals with lower %bf exhibit a greater metabolic rate, as meas by VO_2 for 30 min following strenuous exercise than those individuals with higher % bf. Individuals with lower %bf also utilize more fatty acid as substrate fuel and dissipate body heat more rapidly post-exercise. It may be speculated, therefore, that decreased bf in individuals serves as an asset in terms of the metabolic benefits of the recovery processes from exercise as well as from the exercise itself. Further research is required to determine if these post-exercise metabolic characteristics of lean Ss are responsible in part for their leanness.

48. RODE, E.J. Mechanisms of residual lung volume changes with maximal and submaximal exercise. MSc in Physical Education, 1990

Increases in RV following exercise have been repeatedly observed. Several investigators have theorized that increases in pulmonary extravascular water vol (PEW) or perhaps decreases in expiratory muscle strength may account for this increase in RV. In order to further understand possible mechanisms involved in post-exercise lung vol changes, 12 healthy, nonsmoking M, between the ages of 20 and 30 yrs, performed 2 bouts of exercise on separate days, one max to voluntary exhaustion, and the other at 85% of meas max HR for at least 20 min. Prior to exercise and at 5, 15, 30, 60, and 120 min post-exercise, the following meas were taken: RV, forced vital capacity (FVC), forced expiratory volumes at one half and one sec ($FEV_{0.5}$ and $FEV_{1.0}$), respectively, max expiratory pressure (PEmax), max inspiratory pressure (PImax), whole body bioelectrical impedance (Z), and transthoracic electrical impedance (TEI). Total body water (TBW) was calculated from whole body bioelectrical impedance meas. RV increased sig ($p \le 0.05$) at 5, 15, and 30 min following max exercise and at 5 and 30 min following submax exercise. Sig ($p \le 0.05$) decreases in FVC at 5, 15, 30, and 60 min after both max and submax exercise accompanied the increases in RV. Increases in $FEV_{0.5}$ and $FEV_{1.0}$ were sig ($p \le 0.05$) at several time points; however, they fell within the range for normal variation in daily meas. PEmax decreased sig ($p \le 0.05$) at 5 and 15 min following max exercise and at 5 min following submax exercise. TEI decreased sig ($p \le 0.05$) at 5 and 15 min after max exercise and at 5, 15, and 30 min after submax exercise. Submax exercise changes in pulmonary function were generally smaller than those caused by max exercise. These data suggest that intensity of exercise is more of a determinant of increases in RV following exercise than duration. While TEI meas indicate an increase of PEW, $FEV_{0.5}$ and $FEV_{1.0}$ tend to indicate that there was no increase in airways resistance associated with increases in PEW. It is concluded that decreases in expiratory muscle strength due to fatigue are manifested as increases in RV.

49. SULLIVAN, J.K. Development of a wellness program based on the administration of a needs assessment questionnaire. MSc in Physical Education, 1990

The purpose of this study was to administer a needs assessment questionnaire and to determine an appropriate health maintenance prog for an anonymous company in Fort Collins, CO. A Needs Assessment Questionnaire was sent to a stratified gp of employees according to percentages of total employees in each of the 4 designated job categories. A total of 700 questionnaires were sent via company mail to the selected individuals, preceded by a letter explaining the survey, accompanied by a letter that included an incentive coupon for a free ice cream or yogurt at the company cafeteria, and followed by a letter reminding individuals to complete the questionnaire. The letters were sent at 1 wk intervals. Anonymity was assured, with no names or identifying marks used on any of the letters or forms. The questionnaire was designed so that responses could be marked on a computer answer sheet. Of the 700 questionnaires distributed, 553 or 79%, of the answer sheets were completed and returned. The results of this study indicate that employees of this organization have strong interest in a comprehensive wellness prog. Over 90% of the respondents indicated a desire to improve their fitness level, and over 80% wanted to improve their energy level, health, and wt/appearance. Health risk areas were noted to be stress levels, low fitness levels, poor nutrition, and overweight. Less than 20% of the employees indicated risk with high DBP, high SBP, smoking cigarettes, seat belt usage, and alcohol usage. In reporting health problems over the past year, over 60% of the respondents complained of stress/tension. Over 40% noted problems with overweight, muscle/joint problems, and sleeping problems or fatigue. Back pain and depression followed with over 30%. Interest in wellness prog was high, with over 70% indicating that they "definitely" or "probably" would participate in prog on fitness and stress management. Activity preferences were health seminars, exercise equipment, swimming, and walking. The most popular time for offering exercise prog was 4:00 to 6:00 p.m., followed by lunch time. Lunch time was the preferred time for health related prog. The respondents indicated that they would be likely or very likely to share the prog cost, and were interested in spouse participation. Because of the high level of interest on the part of the employees of this organization in improving health and fitness, coupled with the relatively high levels of health risk in the areas of stress and a lack of regular aerobic exercise, development of a comprehensive health promotion prog is recommended.

COLUMBIA UNIVERSITY (J. HIGGINS)
NEW YORK, NEW YORK

50. BEHESHTI, Z. Effect of imposed auditory rhythms on human interlimb coordination. EdD in Physical Education, 1990. (J.R. Higgins)

This study investigated the effect of imposed auditory rhythms on human interlimb coordination. This issue is important as many human mvmts involve the simultaneous mvmts of the upper and lower extremities while the individual is following externally-paced rhythms. The present study was designed to further investigate the neural and dynamic properties underlying the control of rhythmic limb mvmts. 18 seated adult Ss performed simultaneous clapping and alternate foot tapping. In the first session, Ss were required to perform the task at their preferred rate. In the second session, Ss foot tapped following the rates of the metronome at 1, 2, 3, and 4 Hz (in 1-Hz steps), and clapped at their preferred rate. Finally, in the third session, Ss clapped at the metronome rates at 1, 2, 3, and 4 Hz (in 1-Hz steps) and foot tapped at their preferred rate. Data anal included the clap and foot tap cycle phase-linkage, period and variability meas. The results indicated that at the preferred rate, 50% of the Ss manifested tight phase-linkage between the clap and foot tap cycles, while 50% showed loose phase-linkage of the clap and foot tap cycles. During the exp conditions both tight and loose subject gps maintained their group phase-linkage. Both gps, however, manifested similar changes in both the clap and foot tap cycle period and variability when they clapped or foot tapped with the metronome. These changes indicated a mutual interaction between the clap and foot tap cycles. Neither cycle dominated the other one. The variability of the foot tap and clap cycle periods increased during the exp condition. The loose subject gp showed more variable cycle periods across sessions as compared to the tight subject gp. The changes in cycle period and variability meas which occurred as a result of the exp conditions are similar to those reported by Muzii . Muzii utilized a similar task, although Ss foot tapped and clapped at self-paced rates. The similarity of the results of the present study and those of Muzii's suggests that the processes underlying the coordination of the self-paced and externally-paced limb mvmts may be similar.

51. HOWELL, L. The effects of interpersonal relationships on the development of successful female athletes. EdD in Physical Education, 1990. (M.M. Mackenzie)

The purpose of this exploratory study was to go beyond journalistic reports and systematically investigate the degree to which interpersonal relationships are sig—positively or negatively—in the dev of elite athletic performance by girls and women. Until recently the topic of how women succeed has been largely ignored in our culture and in acd study. Instead, we find numerous theories about women's failure to succeed. Many such theories explain lack of success in terms of women's need for affiliations or interpersonal relationships. Early studies of achievement have been limited in their perspective by meas F dev against M models; using a M model of success rather than regarding an alternative view proposed by Gilligan (1982) and Miller (1976) that indicates the positive nature of women's need for attachments and caring. Only a few researchers have recognized the importance of interpersonal relationships in F achievement and have used psychological theories to guide their investigations. Specifically, investigators have not incorporated a theoretical approach to describe and explain the psychosocial development of athletes (Weiss & Bredemeier, 1983). The data for this study were obtained by conducting in-depth interviews with elite women athletes, specifically 4 professional women golfers and 4 U.S. Olympic volleyball players. 3 major themes having to do with success were extracted from the existing theory and research on accomplished performers, particularly athletes, to provide a guide for structuring questions as well as anal the data. These themes are: beliefs and attitudes, dev of talent, and self-esteem. Subtopics within the themes were further identified by the athletes. After the data were coded, the themes from team and individual athletes were compared to see what similarities and diff existed between the 2 gps. The results of this study indicate that for the 8 elite athletes, affiliative and achievement goals were not mutually exclusive, but that sig interpersonal relationships were instrumental in fostering athletic success. Specifically, parents, siblings, peers, and coaches were instrumental in helping the athletes dev 11 beliefs and attitudes. Although factors deterring performance were identified by the athletes, sig others were not influential in deterring success. The emphasis in sport psychology today has been on enhancing optimal performance. However, this research indicates that the athletes believed that mental skills were only part of their success. Rather, the influence that sig others played in providing emotional support was central to their success as athletes. Consequently, sport psychologists who focus solely on performance enhancement issues with athletes may be limited in their approach to helping an athlete. A comprehensive humanistic approach to working with athletes would be indicated

52. HUBER, P.A. A modified training program for pre-student teachers to optimize pupil motor engagement time. EdD in Physical Education, 1990 (W.G. Anderson)

This study focused on the implementation of a modified training procedure intended to assist pre-student teachers in acquiring teaching techniques to optimize pupil motor engagement time (MET). The techniques included those which involve organizing, managing, and monitoring PE classes. A training procedure developed previously by Borys (1982) was modified to train pre-student teachers in specific techniques to optimize pupil MET. After a preliminary field test was conducted using the modified procedures, a final field test was implemented with 5 pre-student teachers. The procedures included a workbook that served as a basis for instructional sessions, systematic observation of techniques and pupil MET, and teaching during a pre-student teaching field exp. Each pre-student teacher taught 3 lessons at his/her field site. Systematic observation of pupil MET was accomplished through the use of a modified version of BESTPED (Behavior of Students in PE, Laubach, 1974) for each of the lessons taught by each preservice teacher. The activities taught by the preservice teachers were varied as were the field sites and cooperating teachers. Various evaluation procedures were used by the pre-student teachers to anal pupil MET and techniques implemented. A follow up, which included pupil MET anal, was conducted during their student teaching field exp. The results suggest that pupil MET varied with the activity, the preservice teacher, and the contextual factors. The M % of pupil MET during pre-student teaching was 30.1 while in student teaching the M % of MET was 42.3. The increase can be attributed to a high % of game play during student teaching. The no. of techniques implemented increased during the field exp. Self-anal of the results of each lesson seemed to influence the planning of subsequent lessons. This study suggests that generalizations cannot be made about pupil MET, teaching, and the training procedures. The results were influenced by such variables as the cooperating teacher, activity being taught, and the contextual factors. As expressed by the preservice teachers, the training procedures developed an awareness of the complexities of teaching. Individual profiles suggest that the procedure had diff effects on diff preservice teachers.

53. MYERSON, M.L. Etiology of athletic menstrual dysfunction. EdD in Physical Education, 1990 (B Gutin)

The etiology of athletic menstrual dysfunction (AMD) remains unclear. Many factors have been associated with AMD including age, training regimen, and in particular, bf. Recent studies have shown that although bf is similar in amenorrheic (A) and eumenorrheic (E) athletes, the A tend to have a diet which lacks the quantity and quality of the E athletes. The first part of this dissertation, AMD I, hypothesized that dietary factors, along with metabolic (energy-saving) adaptations, would distinguish A and E runners and sedentary controls (S). A and E were similar in bf determined by hydrodensitometry (HD) and in other physical and training characteristics. The caloric intake was lower (but not sig) in the A and they scored sig higher on a scale of aberrant eating patterns. Resting metabolic rate (RMR), adjusted for bw and in a separate anal, adjusted for fat-free mass (FFM), was reliably lower in A than in E and S. It was concluded that in runners with relatively inadequate diets, lower RMR and cessation of reproductive function may serve as energy-conserving adaptations. Research has shown that the hypoestrogenia associated with amenorrhea reduces total body bone density (TBD). This in turn, may lead to overestimated HD-determined bf in A athletes because HD assumes a uniform density of FFM. Thus, the A runners in AMD I may actually have had lower levels of fat than the E runners. This question was examined in AMD II. Dual-photon absorptiometry (DPA) meas bone density and bf, and bypasses the assumption of uniform density of FFM. A and E runners, and S, had their bf meas by HD and DPA, and the results compared. TBD and several regional bone densities were sig lower in A than in E and S; however, no sig error was found in the determination of fat by HD when compared to DPA. Thus, AMD II supported the finding of the first study which found that bf did not diff sig in A and E runners, suggesting that nutritional and metabolic factors were more important in the etiology of AMD.

DALHOUSIE UNIVERSITY **(C.PUTNAM)**
HALIFAX, NOVA SCOTIA

54. CAMERON, H. The effect of in-service training on the degree of implementation of a health curriculum. MA in Health Education, 1990

This study had two aims. First, it aimed to investigate the effect of diff types of in-service training on the degree of implementation of a grade 4 HE curr in Nova Scotia.. And, it aimed to determine the ability of other variables—teacher satisfaction with in-service training, perceived commitment of the principal and of the school board admin, yrs of teaching exp, and min per wk teaching HE—to predict the degree of implementation. Using a quasi-exp, nonequivalent control gp design with posttest only, teachers (n=41) were assigned to one trial gp and 2 comparison gps. The distal comparison gp received no in-service training, whereas the proximal comparison gp received a single session and the trial gp received ongoing in-service training. The HE Prog Component Checklist developed for this study was used to meas implementation. Data were collected by personal interview. Based on the Mann-Whitney U test, there was a sig greater degree of implementation by the trial gp than by the proximal comparison gp, but not the distal comparison gp. Discriminant function anal revealed that, among 5 variables, perceived commitment of the admin was the best and only statistically sig predictor of high implementation.

NORTHEASTERN UNIVERSITY **(P. GRAHM)**
BOSTON, MASSACHUSETTS

55. ALUF, N.A. The relationship of health belief model and demographic variables to risk factor behaviors associated with heart disease. MS in Exercise Science, 1989, 70p.

159 respondents in the Greater Boston area were surveyed by telephone. They were asked questions pertaining to exercise, diet, drinking, and smoking behaviors. They were also asked questions based on the Health Belief Model (HBM) variables of susceptibility, barriers, cues to action, and benefits. To gather information on events that would cause respondents to better their behavior in the future, an extra variable, future cues to action, was added. The study reports who was taking action to prevent the occurrence of heart disease, who was not, and why. And if so, if this was related to the influence of health professionals and the media. Demographic data were also collected to see if gender, age, educ, income, or ethnic background had any effect on behavior. The results showed that at least 70% of the population was engaged in

preventive behavior, with the exception of eating sweet foods, but that they were not doing so for reasons related to the threat of heart disease or heart attack. And they were not influenced by health professionals or the media. Stepwise multiple regression revealed that the threat of a heart attack during a lifetime affected only exercise behavior and that the threat of a heart attack in the next 10 yrs affected only smoking behaviors. Educ had the second largest effect on exercise behavior and gender and smoking had the greatest effect on drinking behavior. Other than these, no other statistically sig relationships were found.

56. BURCHINAL, E.L. Body composition and physiological characteristics of female professional modern dancers. MS in Clinical Exercise Physiology, 1990, 86 p. (D. Schneider)

% bf, VO_2max, and the ventilatory threshold (T_{vent}) were determined in 13 F professional modern dancers. Using the hydrostatic weighing method, body composition anal revealed a M bf of 17.4%. The treadmill exercise test yielded a M VO_2max of 44.6 ml/kg/min and a T_{vent} of 23.1 ml/kg/min (51.7% of VO_2max). Values for both % bf and VO_2max compared favorably with values previously reported for F professional ballet dancers and highly trained F gymnasts. While % bf also compared favorably with values previously cited for F middle-distance runners, VO_2max compared more favorably with values previously reported for F figure skaters. T_{vent} values were substantially lower than values previously reported for F distance runners, but were only slightly higher than values previously obtained for sedentary F. Thus, the present study suggests that the cardiorespiratory adaptations of modern dance training are more similar to the cardiorespiratory adaptations found for nonendurance-trained athletes than for endurance-trained athletes. It is speculated that the intensity and duration of modern dance training are not appropriate to produce an endurance training effect. Furthermore, only the relationship between years of professional dance exp and % bf (r=-0.51) was found to be statistically sig at the $p < 0.05$ level. Therefore, the data suggests that the yrs of professional dance exp are the most sig determinant of % bf for this gp. The caloric cost of dancing combined with a low calorie diet, as well as the inclination of lean individuals to select a career in dance and become successful professional dancers, may account for the dancers' relatively low level of bf.

57. HARROW, K.J. The relationship of psychological stress with functional capacity, body weight, and stress management attendance and practice in cardiac rehabilitation program participants. MS in Clinical Exercise Physiology, 1989, 84 p. (W.J. Gillespie)

Pre- and posttests of 19 participants from 2 phase III cardiac rehabilitation prog (CRP) assessed changes in the 11 stress dimension subscales (SDS) and the total stress score (TSS) of the Derogatis Stress Profile (DSP), as DVs. Changes in wt and METS, attendance at stress management lectures, practice of stress management techniques (SMT), overall CRP satisfaction, sig life events during the CRP, smoking habits, and work status were independent variables. Results of t-tests between pre- and posttests showed a nonsig increase in the TSS, sig decreases in the Health Posture SDS and wt, and sig increases in the Domestic Satisfaction SDS and METS. Stepwise multiple regression showed sig r of Attitude Posture SDS with wt and METS, and sig r of 8 SDS and TSS with attendance at stress management lectures, practice of SMT, CRP satisfaction, work status, and sig life events. Results demonstrate CRP have positive effects on certain dimensions of stress and sig relationships to certain prog components and personal characteristics.

58. KELLY, T.S. The effects of organized sport/fitness programs on the measurable fitness levels of children ages 9-12. MS in Cardiovascular Health and Exercise, 1990, 38 p. (R. Curtin)

209 children (9-12 yrs) were given the AAHPERD Physical Best fitness test to determine their current fitness levels. The fitness test consisted of 1 mile walk/run (R), pull-ups (P), sit-ups (S), flexibility (F), and skinfold meas (SK). Each student was asked to fill out a survey form. This form indicated how many sports the child participated in and how often (seasons). The scores were compared to determine if involvement in organized prog affected fitness scores by: the number of sports they participated in or the amt of time spent participating in prog. Scores were collected and used in a stepwise regression anal to determine if components in the fitness test were affected. A no. of variables (gender, age, no. of sports, no. of seasons, and SK) were used to determine which had the greatest effect on the test scores. Results showed a correlation between lower SK and greater no. of sports children participated in. SK was lower in students who participated in greater nos. of sports (SK was used as a meas of wt). This, however, accounts for a very small percentage of the variance (02.3%). Low SK accounted for a small % of the variance in the following test scores: R (22.5%), P (18.0%), and S (11.3%). Gender had the greatest effect on flexibility with F shown to score higher than M. This suggests other variables not used in this study must affect fitness scores.

59. MCDANIEL, C.W. Duration and quality of prone extension and supine flexion postures in children ages six to eleven. MS in Physical Therapy, 1990, 68 p.

The purpose of this study was to evaluate the ability of children to assume and maintain 2 dev postures, prone extension and supine flexion. The main concerns of this research were to determine 1) if performance of prone extension and supine flexion postures increases with age; 2) if the quality used to assume and maintain these postures improves with age; and 3) if the variables of gender, ht, and/or wt of the Ss affect performance scores. The sample consisted of 128 children, 52 boys and 76 girls, ages 6 through 11 yrs old. Duration scores for maintaining supine flexion and prone extension postures were meas in sec, with a 90 sec limit imposed by the examiner. Quality of mvmt was rated on a scale of 0-12 for prone extension and 0-10 for supine flexion. The ht and wt of each S was also recorded. Supine flexion scores increased with age and were sig diff between 6 yr olds and 8, 9, and 10 yr olds and between 7 yr olds and 8, 9, 10, and 11 yr olds. Statistically sig diff were not found between 6 and 7 yr olds or between 8, 9, 10, and 11 yr olds. By age 6, 71% maintained supine flexion for more than 20 sec. 100% of the 9 and 11 yr olds scored more than 20 sec duration. Statistically sig diff were not found between any age gp for prone extension. It was noted that 76% of the 6 yr olds and 100% of the 9 and 11 yr olds maintained prone extension for more than 20 sec. A majority of the Ss scored 10 or above on the quality rating scales. Performance of M and F was not sig diff. Ht and wt were not sig correlated with duration scores with the exception of wt and supine duration (r=.53) in the 6 yr olds. This study supported Ayers standard of 20-30 sec as the norm for prone extension and supine flexion duration for children ages 6 and above. The quality rating scale may provide a descriptive standard for normal performance compared to atypical performance.

60. PULLEN, R.J. The physiological responses of asymptomatic post-PTCA subjects with positive exercise tolerance tests. MS in Exercise Science, 1990, 78 p. (W. Gillespie)

Physiological variables were recorded retrospectively on 19 Ss (14 M and 5 F), who had successful PTCA and objective evidence of ischemia on ETT, 2 to 3 days post-PTCA in the absence of symptoms. RPP (indirect meas of myocardial VO_2) and METS (functional capacity) at onset of ST depression and max exercise were compared on all available ETT's at pre-, and immediate post-PTCA, and at 6, 12, 24, and 52 wks. In addition, anginal symptoms and ST depression were noted at weeks 6, 12, 24, and 52. Results demonstrated sig (p<.01) improvements in functional capacity and myocardial VO_2 immediate post-PTCA ETT. Follow-up results showed improvements in RPP and METS were maintained for 8 of 16 t-test comparisons, which were supported by MANOVA repeated meas test, and inconclusive for the other 8 tests. There were no sig changes by age (≤60>) and gender for RPP and METS between pre- and immediate post-PTCA. Comparison of anginal symptoms and ST depression on follow-up ETT's by gender revealed similar results for M and F Ss. Ss ≤ 60, demonstrated more frequent anginal symptoms (50% vs. 9%) and ST depression (75% vs. 45%). 8 Ss (42%) demonstrated improvements on follow-up ETTs with resolved symptoms. 5 Ss (26%) continued to demonstrate sig ST depression in the absence of symptoms while 6 Ss (32%) presented with a more compromised state (an increase in ST depression and/ or anginal symptoms).

61. SILVER, J.E. Changes in depression levels following walking and stretching programs in elderly institutionalized patients. MS in Exercise Physiology, 1989, 69 p. (D. Schneider)

The primary purpose of this study was to determine if either a walking or stretching prog was effective in reducing depression levels in elderly institutionalized patients. A secondary objective was to compare the effectiveness of the 2 prog. 22 elderly institutionalized patients were assigned to either a walking, stretching, or nonexercising control gp. During the 12-wk treatment period, the walking and stretching gps met 3 times per wk for 30 min per session, while the control gp continued their usual routine. Before and after the 12-wk treatment period, all Ss answered the Beck Depression Inventory (BDI) and performed a standardized 1-min step test. A decreased score on the BDI after a treatment period indicates a reduction in depression level, while a decreased HR response to the standardized step test suggests an improvement in aerobic fitness level. The walking gp showed no reduction in either resting HR or HR response to the step test, suggesting that fitness did not improve. There was a trend toward reduced levels of depression in both the walking and stretching gps, but no trend toward change was observed in the control gp. However, these trends were not found to be statistically sig ($p=0.079$). It was concluded that the walking prog was of insufficient intensity to improve aerobic fitness, and that neither the walking or stretching prog were effective in improving depression levels in this population. The walking prog was not found to be more effective than the stretching prog in reducing depression levels.

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DEKALB, ILLINOIS

62. LENZINI, K.L. Cross-validation of the Rockport Fitness Walking Test in females 65 years and older. MS Ed in Physical Education, 1989, 49 p. (S.A. Plowman)

The reliability, validity, and training sensitivity of the Rockport Fitness Walking Test (RFWT) was established on 16 F, 65-77 yrs of age. 12 Ss in the exp gp participated in a 20-wk low-impact aerobic class and 4 Ss were in the control gp. Both generalized and gender specific equations were utilized to estimate VO_2 max in $1.min^{-1}$ and $ml.kg^{-1}.min^{-1}$ from the time of a 1-mi walk, HR at the end of the 1-mi walk, wt, and age. The 1-mi walk was completed by all Ss on 4 diff occasions, 3 prior to training (W1, W2, W3) and 1 after training (W4). Reliability improved from .63 for the first 3 trials (W1, W2, W3) to .96 for the last 2 trials (W2, W3). Cross-validation compared the estimated VO_2 max results from the 1-mi test with the meas VO_2 max results determined on the treadmill. The results indicated r=.68, SEE=.15 $1.min^{-1}$, Error= .22 $1.min^{-1}$ for the F equation and r=.80, SEE=1.99 $ml.kg^{-1}.min^{-1}$, Error=4.71 $ml.kg^{-1}.min^{-1}$ for the generalized equation. No sig diff was found between the M of the estimated VO_2 max and meas VO_2 max ($p>.05$). No sig diff in gain scores in estimated (M VO_2 pre=1.34 $l.min^{-1}$ ±.32, M VO_2 post=1.38.$1.min^{-1}$ ± .34) or meas (M VO_2 pre=1.35 $1.min^{-1}$ ± .21, M VO_2 post=1.37 $1.min^{-1}$ ± .21) VO_2 max values occurred from pre to post. Therefore, the RFWT was sensitive to the lack of training change in exercising individuals. It was concluded that the RFWT is a reliable, valid, and sensitive cardiovascular-respiratory field test for F 65 yrs and older for screening and monitoring the effectiveness of a training prog.

63. SLIVA, L.A. An analysis of the reaction times and horizontal and vertical velocities of the middle blocker in volleyball. MS Ed in Physical Education, 1989, 56 p. (M.N. Zimmerman)

12 highly trained F volleyball players (16-19 yrs) were anal in the position of middle blocker to compare the RTs and horizontal and vertical velocities in response to a two-light (2) and three-light (3) stimulus. Ss were filmed performing a jab cross-over step followed by a block jump under both light stimulus conditions to their preferred (P) and nonpreferred (N) sides. A sig diff ($p<.05$) was found between RTs for Ss responding to a two-light and a three-light stimulus (P2=0.253±.04 sec; P3=0.275 ± .05 sec; N2= 0.253 ± .06 sec; N3= 0.281 ± .05 sec). No sig diff were found between RTs for Ss responding to the preferred and nonpreferred sides, or for the interaction between the two factors. For the hurdle component of the jab cross-over step, horizontal velocities at takeoff (P2= 3.50± .19 m/s; P3= 3.52 ± .19 m/s; N2=3.59 ± .17 m/s; N3= 3.59 ± .22 m/s) were not sig diff ($p>.05$). The ave horizontal velocities of the complete lateral mvmt (P2= 2.16 ± .15 m/s; P3= 2.15 ± .14 m/s; N2= 2.16 ± .14 m/s; N3= 2.22 ± .23 m/s) were not diff across conditions ($p>.05$). For vertical velocity at takeoff of the block jump (P2= 2.51 ± .22 m/s; P3= 2.57 ± .23 m/s; N2= 2.57 ± .24 m/s; N3= 2.59 ± .23 m/s) no sig diff were found ($p>.05$). The results suggest that highly trained middle blockers have a longer RT when responding to a three-light stimulus

than to a two-light stimulus, but that the investigated velocities are not sig diff across the light or direction conditions.

64. WILLMS, W.L. The singular and combined effects of exercise and meal ingestion on caloric expenditure. MS Ed in Physical Education, 1989, 59 p. (S.A.. Plowman)

The influence of exercise on the thermic effect of food (TEF) has been examined in 10 untrained F Ss. The Ss participated in 4 separate testing sessions which consisted of postabsorptive resting metabolic postabsorptive exercise MR (ENF); and postabsorptive exercise followed by postprandial MR (EF). The TEF averaged a 15-26% increase in VO_2 consumption (.294 ± .049) and kcal expenditure (1.47 ± .24) during recovery. There was a sig but similar elevation of mean VO_2 uptake during recovery by 14.96% in the NEF (.29 ± .049) and 13.70% in the EF (.292 ± .048) protocol ($p<0.01$), indicating no additive effect of food in combination with exercise. Although meal ingestion caused a TEF, metabolic data did not diff during recovery when exercise was added; therefore exercise did not enhance TEF. However, the EF protocol yielded a sig greater overall caloric expenditure (304.40) compared to the other protocols (NENF= 121.18, NEF= 142.13; ENF= 291.43) signifying the added benefit of exercise in wt reduction.

OHIO STATE UNIVERSITY **(W.M.SHERMAN)**
COLUMBUS, OHIO

65. BETTS, J.J. Duration of improved muscle insulin action in the obese Zucker rat after a single exercise session. Ph.D. in Physical Education, 1990 (W.M. Sherman)

The present study determined the duration and magnitude of the effects of acute exercise on skeletal muscle glucose uptake and its disposal in the obese Zucker rat. Previously sedentary, 15-wk-old obese Zucker rats were exercised for 2 hr on a motorized running wheel using a 30min:30min, work:rest ratio. The rate of hindlimb glucose uptake was meas during hindlimb perfusion either 1 hr, 48 hr, or 72 hr after exercise, and in sedentary lean and obese animals. Rates of glucose uptake were meas with 0 mU/mL insulin (basal) and 20 mU/mL insulin (max) present, and insulin responsiveness was indicated by the net glucose uptake rate (max-basal). Intramuscular glucose disposal was determined for max insulin stimulation by meas the incorporation of carbon-14 glucose into glycogen, carbon dioxide while lactate production was calculated. Compared to sedentary lean animals, sedentary obese Zucker rats had sig lower insulin responsiveness of muscle glucose uptake. There were no sig alterations in the hindlimb disposal of glucose uptake between sedentary obese and lean animals indicating the impaired glucose uptake of obese rats was probably due to impaired glucose transport. Exercise sig improved the responsiveness of muscle glucose uptake for obese rats at 1 hr and 48 hr after exercise to levels equal to lean rats. By 72 hr after exercise the increased responsiveness of glucose uptake was not present when muscle glycogen levels were sig elevated. Insulin levels were sig decreased 48 hr but not 1 hr after exercise compared to sedentary obese rats. Exercise did not alter glucose disposal indicating the improved responsiveness of muscle glucose uptake after acute exercise was due to increased glucose transport. Increased muscle glucose uptake of obese animals 48 hr after acute exercise may have been due to the decreased insulin levels or the delayed elevation of muscle glycogen.

66. BURKLEY, R.L. The effectiveness of behavioral contracts in promoting the maintenance of cancer risk reduction behavior while utilized in a college cancer avoidance course. MA in Health Education, 1990 (M.S. Chen, Jr.)

In the spring of 1988, 249 students attended a Cancer Avoidance course at Ohio State Univ in Columbus, OH titled, "How to Avoid Dying From Cancer . . . Now and Later." During the course, students were given a behavioral contract assignment in an effort to assist them in adopting cancer risk reduction behaviors. 3 months after course completion, a follow-up survey was sent to 50 students. At the time of the survey, 81.6% of the students were still maintaining their cancer risk reduction behavior. This resulted in 93% of the students who were successful with their behavior by course completion also succeeding in maintaining their behavior up to 6 months later.

67. COOLEY, J.L. Furosemide and exercise: The hormonal response in the horse. MA, 1990

Six adult untrained mares were used to examine the effects of prior admin of intravenous furosemide (1 mg/kg body wt) on hormonal responses during submax exercise on a treadmill. The horses ran for 60 min up a 6% grade at approx 60% of max HR. The exp consisted of 3 trials performed in a randomized cross-over design. Trial 1 included the admin of furosemide 4 hr prior to exercise, trial 2 included furosemide 5 min before exercise, and trial 3 acted as a parallel control receiving no furosemide. Blood was drawn for the meas of plasma renin activity (PRA), aldosterone and atrial natriuretic peptide (ANP) just prior to exercise, every 3 min during the first 15 min of exercise, and every 15 min thereafter. Atrial natriuretic peptide concentration increased 30 min into exercise in trial 3, however, ANP did not change ($p>.05$) during exercise in trials 1 and 2. Plasma renin activity increased in all gps by 3 min into exercise and trials 1 and 2 were sig higher than trial 3 by 3 min into exercise. Aldosterone concentration also increased in all 3 gps during exercise, but there were no sig diff among treatments. Furosemide admin prior to submax exercise in the horse attenuates atrial natriuretic peptide concentration, enhances plasma renin activity, and does not affect aldosterone concentration.

68. LUND, J.L. Student performance and accountability conditions in physical education, Ph.D. in Physical Education, 1990 (D. Siedentop)

This study examined accountability systems in PE. 5 teachers were observed using descriptive analytic methodology. Results of the study show accountability to be in a hierarchical configuration. The basis for this hierarchy was teacher monitoring. This lowest level was termed quasi-accountability as students were only held accountable for good behavior. As more instructional demands were placed on students, diff types of accountability were utilized. Broad categories for these types included aversives, public recognition, and grading. Subcategories were also identified for these accountability techniques. Some teachers combined these categories for additional techniques. Student response rates increased as more types of accountability were implemented. High response rates were associated with accountability techniques other than grading. The study also argues that student response rate is a better indicator of student performance than activity time. The teacher in this study with the lowest activity time had the highest response frequency as well as the most cumulative responses for the unit. The interrelationship of the managerial and instructional task systems was evident in this study. Accountability alone cannot ensure quality teaching, but it is a necessary and vital element to instruction.

69. OSLIN, J.L. Effects of component-specific interventions on overhand throwing performance of preschool children, 1990 (D. Siedentop)

A variety of instructional techniques such as fb, mental practice, modeling, and use of demonstrations have been examined by PE researchers to determine their effect on motor skill acquisition and performance. However, most PE research paradigms have meas improved performance via product variables, such as target scores or trials to criterion. Although process meas of sport skill can provide information regarding how motor skills are learned, they have been avoided due to lack of valid and reliable methods to meas changes in performance from one trial to the next. The purpose of this study was to use component specific instruction (CSI) to increase the dev levels of 9 components of overhand throwing (Siedentop, Herkowitz, & Rink, 1984). The Sport Skill Process Variable Assessment instrument (Stroot & Oslin, 1990), which meas specific performance components demonstrated during the overhand throw, was used to determine overhand throwing performance of preschool children. An archery target was used to assess accuracy and served as a product meas for throwing performance. Component-specific instruction was presented in 2 diff sequences: 1) force production sequence, and 2) forward chaining sequence. A multiple baseline design across Ss was used to anal the effects of CSI upon all components of each throwing response and allowed for the testing of 2 component sequences. Exp sessions were conducted in a portable environment, designed to provide optimum control within the confines of the preschool setting. 7 F from a local preschool, 3.4 to 5.8 yrs of age, participated in the study. Exp sessions were held from 2 to 5 days per wk. The no. of sessions required to meet the criteria of 20 consecutive throws with all components at high efficiency ranged from 13 to 26. Five CSI interventions were required: step, rotation/backswing, elbow/backswing, forearm/forward, and rotation/forward. Intervention strategies improved efficiency levels for components specific to overhand throwing performance for all Ss, with no diff between Ss in the force production sequence and Ss in the forward chaining sequence. Sig correlations resulted between % of hits on target and % of high efficiency throws for 5 or 7 Ss. Residual effects occurred consistently in corresponding components.

70. RANDALL, K.M. Possible mechanisms underlying the increased breath-hold ability of synchronized swimmers. MA in Physical Education, 1990 (R.L. Bartels)

To investigate the role of lung volume and hypercapnic sensitivity as possible mechanisms for enhanced breath-hold ability, 12 members of The Ohio State Univ Synchronized Swim Team were studied. The synchronized swimmers demonstrated sig longer max breath-hold times at rest and during low-level arm exercise and larger vital capacities than recreationally active control Ss (p=0.0001). There were no diff in sensitivity to hypercapnia between the 2 gps at rest or exercise. Max resting breath-hold time correlated pos with max exercise breath-hold time in the synchronized swimmers. Max breath-hold time was positively correlated with hypercapnic sensitivity at rest in the control gp only.

71. ROTH, R.R. Recontextualizing education through the physical: A somatic approach. Ph.D. in Physical Education, 1990 (S. Kleinman)

This conceptual anal of educ through the physical focused on 3 philosophical orientations in educ: 1) the materialistic approach espoused by Edward Thorndike and B.F. Skinner, 2) the pragmatic approach espoused by John Dewey and George H.

Mead, and 3) the somatic approach espoused by Thomas Hanna and F.M. Alexander. The pragmatic and somatic conceptions of educ exp describe human conduct as a dynamic process of reconstruction, whereas the materialistic approach limits itself to anal of discrete behavior. Dewey formulated his theory of exp on psycho premises. His effort to develop a process-oriented philosophy is seen in his 1986 article, "The Reflex Arc Concept in Psycho," in which he explained his own conception of conduct in his theory of "the act." " The "act" became the basis for his experimentalist model of exp. F.M. Alexander, an Australian-born actor, had discovered a principle and subsequently developed a method of kinesthetically-based educ. Dewey met Alexander in 1914, and subsequently took lessons from him. Dewey's exp under Alexander convinced him that Alexander's work had great scientific and educ value. His support of Alexander's work is demonstrated in his references to Alexander in his books, Human Nature and Conduct (1922), and Experience and Nature (1925). Thomas Hanna, a philosopher and somatic educ, has also recognized Alexander as a pioneer in the field of somatics. Hanna has described the aim of somatic research and educ as being concerned with exploring the body as perceived from within by first-person perception. First-person perception is immediate and corresponds to Dewey's concept of qualitative immediacy. It is believed that Alexander's work is a valuable tool to physical educators, because it deals primarily with kinesthetic awareness. It is also believed that other somatic educ practices affirm Dewey's educ philosophy by fostering the capacity for intelligently-funded conduct.

72. RUSH, D.A. Improving skill analysis for diving. Ph.D. in Physical Education, 1990 (D. Siedentop)

The purpose of this study was to investigate the effectiveness of graphic and video training protocols on analytic and diagnostic skills used for diving. The study also examined the extent to which analytic and diagnostic skills generalized to trained and untrained dives. The design used for the study was a multiple probe baseline design across 4 basic dives: forward dive, back dive, inward dive, and forward dive half twist. Ss included 14 volunteers who had an interest in swimming, diving, and/or PE. The study was conducted over a 5 wk period. Graphics and video interventions were admin in a sequential fashion for all 4 dives. Performance assessment tests were admin after each intervention. Performance assessment tests asked Ss to verbally and visually identify critical performance elements, discriminate major errors, and diagnose which error to correct first for each of the dives observed. Generalization testing was admin following completion of all training protocols. Data were visually anal. Results indicate that baseline meas for anal and diagnosis capability of Ss were low. Induction did occur for both anal and diagnosis due to similar verbal labels used to describe critical performance elements and major errors. Ss with diving and coaching exp were able to use information they learned from interventions better than Ss with no diving training. Proficiency levels for both anal and diagnosis improved sig after graphics interventions. Ss were able to maintain and/or continue to improve analytic and diagnostic proficiency levels after video interventions. Training for diagnosis was not as effective as training for anal with the method employed. Analytic and diagnostic skills acquired through training protocols were generalized to trained and untrained dives.

73. SHIN, H.K. The nature and scope of Eastern thought and practice in contemporary literature on American physical education and sport (1953-1989). 1990 (S. Kleinman)

This study traced the emergence of Eastern thought and practice in contemporary American PE from 1953 to 1989. The study aimed: 1) to examine Eastern concepts expressed in the lit of American PE and sport published during this period, 2) to identify to what extent Eastern thought and practice have emerged, and how they affect the direction of contemporary American PE, and 3) to suggest directions in American PE, should these Eastern forms and practices become more fully integrated. To familiarize the reader with essential Eastern theory and practice, Chapter II briefly described Eastern philosophies, including fundamental notions from Buddhism, Confucianism, Taoism, and Zen. The world view these ideas amplify was related to PE and sport. Chapter III traced the emergence of Eastern concepts in American PE and sport. 3 distinctive acculturation stages were considered: 1) acquaintance, 2) appropriation, and 3) transformation. In the course of these 3 stages, Eastern ideas and approaches were introduced, pragmatically adapted, and creatively synthesized, leading to an emergence of new theoretical orientations, alternatives to traditional Western paradigms. A review of the growing body of lit suggested that Eastern theories and practices have emerged in the areas of philosophy, pedagogy, objectives and curr, and training methods in PE and sport. The review revealed that an increasing no. of physical educators have linked the nature, methods, and content of American PE to Eastern concepts and practices. Chapter IV attempted to identify to what extent Eastern thought and practices have emerged in contemporary American PE. This emergence of Eastern thoughts and practices seemed varied and extensive, involving a change of attitude, methods, and content to traditional American theories and practices. Based upon the specific findings and discussions presented in this study, the following general conclusions were drawn. Because Eastern thought and practice continue to emerge, the consequences for American PE are not entirely clear. Passing through a distinctive "acculturation process" in diff environmental and intellectual settings, Eastern ideas and practices have contributed to the evolution of American PE and sport over the past 3 decades. But many examples of Eastern thought and practice are still in the early stages of dev in the West, and thus their merit has not been thoroughly established in American PE. Nevertheless, Eastern thought and practice are contributing to a new paradigm for American PE and sport. These contributions may help direct the evolution of PE and sport in the twenty-first century.

74. TIPPS, C.R. Effectiveness of teaching methods (group vs. individualized) on secondary age females in the physical education environment.

The purpose of this study was to examine and contrast the effects of teaching methodologies (direct/gp and individualized) on ALT-PE of students as they were presented in instruction of PE activities and to determine if one teaching style was more effective than the other with regard to specific PE activities and specific age gps. A combination of alternating treatments and gps comparison designs was applied to observe 2 classes of 10th, 11th, and 12th grade students during a 6 wk instructional period of 4 PE activity units (gymnastics, volleyball, conditioning, pickleball) which occurred naturally during the secondary PE curr. There were 2 independent variables: direct/gp method of instruction and individualized method of instruction. 6 F (3 from each class = 1-10th, 1-11th, and 1-12th) were randomly selected and observed as they participated in both methods of instruction, during a 6 wk period, and across 4 diff activity units. Teacher and student behaviors were observed and recorded by a trained doctoral student who employed the WV Univ Teaching Evaluation System. This evaluation system utilized an electronic microprocessor to record and extract data on teacher/student behavior durations and frequencies. Percentages of ALT-PE were anal and results indicated that instructional method effectiveness was greatly determined by specific PE activity unit and specific age gp. PE activity units of gymnastics and conditioning exhibited higher levels of ALT-PE when taught through a direct method. The activity unit of volleyball exhibited higher levels of ALT-PE when taught through an individualized method than through a direct method. No method of preference surfaced during the activity unit of pickleball. 12th grade F preferred direct methods of instruction over individualized, however, 10th and 11th grade F exhibited no preference. The results of the study indicate that a functional relationship exists between instructional methodology, PE activity unit, and age gp.

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75. HANER, J.A.S. Determining types and typal profiles of adult amateur theatre through Q-Technique. MS in Leisure Studies, 1989, 118 p. (P. Farrell)

In this study, meanings inherent in the participation of amateur actors and actresses in comm theatre were investigated in order to determine types and typal profiles of the respondents. It was hypothesized that types would diff sig or show sig assoc through the anal of gender, income level, position in the life cycle, occupational category, length and frequency of theatre involvement, level of acting, theatre training, no. of roles performed, and percentage of friends active in theatre. The study population consisted of 157 amateur adult actors and actresses from 6 theatre gps. Q-methodology was chosen as a technique uniquely appropriate to the purposes of this study. A statement deck was dev through the replies of a local amateur theatre prog to an open-ended questionnaire. Statements were divided into 6 factor categories: psycho, communicative, integrative, collective, theatre practitioner, and social status. Data collected through the Q-sort were subjected to Q-anal and an inverse factor anal facilitated the determination of types. 4 types were found and descriptive names were assigned to each, incorporating the most and least applicable statements: The Just-for-Fun Gp, The Local Star, The Self-Explorer, and The Comm Thespian. Demographic and exp information was gathered and anal for assoc between and relationships among Q-types with the use of chi-square and ANOVA. The Comm Thespian diff sig from all other types by having greater acting exp, and by spending more time on participation while in production. Q-methodology is a worthy technique in meas meaning in a rec activity and further studies in this and related fields using this procedure would be advisable. Continuing research into the performing arts as rec serves to promote the viability of such prog.

76. KERSTETTER, D.L. An exploratory study of the pleasure travel behavior of college-educated older adults. Ph.D. in Recreation and Parks, 1990, 194 p. (H.M. Lundegren)

The pleasure travel behavior (i.e., perceived benefits & constraints, past & present behavior) of a random sample of coll-educ older adults was examined with a five-part questionnaire. An overall response rate of 64.9% (n=604) was obtained. To determine whether there were sig relationships between diff variables and pleasure travel behavior, ANOVA, chi-square, discriminant, factor, and hierarchical cluster anal were used. Results suggested that HE, income, and work status were sig ($p \leq .05$) related to pleasure travel behavior. 3 benefit and 3 psychographic factors were found. Clusters or "types" of older adults diff with respect to one benefit and one psychographic factor, their satisfaction with amount of travel, and international travel behavior when young. Level of income, amt of time, having someone with whom to travel, and interest in other cultures contributed most to an individual's decision to travel for pleasure. Major conclusions were: 1) educ older adults are more alike than they are diff; 2) work status, level of HE, and income do not appear to affect all pleasure travel adversely; 3) coll-educ older adults do not seek the same benefits or perceive of constraints in the same way previous studies have postulated; 4) a variety of variables were found to contribute to a person's decision to travel for pleasure.

77. KUNZ, D.E. The effects of a Project Learning Tree workshop on pre-service teachers' attitudes toward teaching environmental education. MS in Recreation and Parks, 1989, 104 p. (P. Farrell)

This study determined if a Project Learning Tree workshop caused a sig pos change in pre-service teachers' attitudes toward teaching environmental educ. A new scale, the Environmental Educ Attitude Scale was dev and used in the study. 140 pre-service teachers enrolled in Science Educ 458, an ELE science educ course at The PA State Univ were selected for this exp study which had a random assignment of equal nos. of Ss to an exp gp and control gp. Paired t-tests and t-tests comparing 2 independent M scores were used to indicate sig increases and diff in attitude scores. The level of sig was .05 for all tests. The findings of the study included: 1) pre-service teachers showed a sig pos change in attitude toward teaching environmental educ after participating in the 7 hr Project Learning Tree workshop; 2) pre-service teachers who have a science emphasis do not show a sig higher score on the Environmental Educ Attitude Scale than those pre-service teachers that do not have a science emphasis; and 3) pre-service teachers who have taken 4 or more coll level science courses do not show a sig higher score on the Environmental Educ Attitude Scale than those pre-service teachers who have taken 3 or less coll level science courses. Based upon the findings and within the limitations of this study, it is concluded that participation in a Project Learning Tree workshop results in a pos attitude change toward teaching environmental educ. It can also be concluded that the Environmental Educ Attitude Scale is a valid and reliable instrument that meas attitudes toward teaching environmental educ.

78. LOVINS, S. The relationship between attitude and implementation of an environmental education curriculum in Pennsylvania public elementary schools. MS in Recreation and Parks, 1989, 134 p. (A. Graefe)

The Attitudes Toward an Environmental Educ Curr (ATEEC) survey was developed for this study and was mailed in fall 1988 to 400 randomly selected principals in the PA public school system. The principals were asked to give the ATEEC to a teacher of a specific grade in their ELE school. A total of 154 surveys (39%) were returned that were usable for anal. ANOVA and X2 statistics were used to anal the data. The statistics showed many sig relationships between attitude and implementation, as well as between attitude and certain demographic variables and implementation and demographics. The sig relationships found provide pos reinforcement for dev prog to promote environmental curr in public schools. As pos attitudes are related to greater levels of implementation, prog could be dev to influence teachers' attitudes about the value of environmental educ.

79. MCDADE, S.E.S. The identification of employee types through Q-methodology: A study of part-time and seasonal recreation and parks employees. MS in Recreation and Parks, 1989, 104 p. (P. Farrell)

The purpose of this study was to survey part-time and seasonal rec and parks employees to ascertain if typal profiles exist, and if so, to identify them. The subproblem was to dev an instrument to define these types. Q-methodology was chosen as the technique most suited to the meas of these employee types. A total of 85 part-time and seasonal employees from 4 southern MN rec and parks dept were the Ss for this study. Employees were asked to complete a demographic questionnaire and to complete the Q-sort. The Q-sort deck consisted of 67 statements representing factors related to the part-time or seasonal rec and parks positions. Each S sorted the 67 statements into 11 piles ranging from "most important to me" to "least important to me." Based on the anal of the data, 3 employee types were identified in this study. These types accounted for more than 40% of the total variance. The ave item placements of each type were calculated and used to describe the employee types. The 3 types were 1) The Humanistic Citizen, 2) The Playful Socialite, and 3) The Professional-in-Training. Relationships between the employee types and the demographic data were tested. A sig relationship was found between employee type and tenure within the dept. The relationship between employee type and gender was found to be not sig. The relationships of educ level and position within the dept with employee type were not tested due to lack of sufficient data. Based on the findings of the study, it is concluded that the use of the Q-sort in determining types and typal profiles of part-time and seasonal rec and parks employees is an effective technique.

80. PERSIA, M.A. The differences among travel agency users in the importance ratings of agency service features. MS in Parks and Recreation, 1990, 150 p. (R.J. Gitelson)

Understanding what consumers view as important can guide marketing decisions. This study determined the importance ratings of 29 travel agency service features for a convenience sample of 330 agency users from Montgomery Co, PA. Factor anal of the 29 importance-rated service features yielded 6 underlying dimensions of agency usage—Information Search, Agent Communication, Peripheral Assistance, Intangible Services, Tangible Services, and Agent Performance. Anal of the dimensions revealed that sig diff existed among agency users based on annual household income, trip purpose, no. of services used, gender, and travel frequency patterns.

81. RICHARD, A.B. The effects of freedom of choice on the participants in a leisure education program. MS in Recreation and Parks, 1989, 143 p. (J. Dattilo)

This study examined the effect that opportunities to make choices had upon participants in a leisure educ prog. The 30 Ss who participated in the study resided in either a rehabilitation hospital or long term care facility, had either a physical or mental disability, and ranged in age from 49 to 88. The leisure educ prog was 14 sessions long and each S participated in at least 10 sessions. A pre/post-test control gp design was utilized. Ss were assigned to one of 2 gps. One gp received opportunities to make choices concerning activities, partner, equipment, and seating arrangements during the sessions. The other gp did not. The dependent meas under investigation were obtained through behavioral observation, subscales from the Leisure Diagnostic Battery (LDB), and personal interviews. T-tests were used to compare the behavioral data, and the data obtained by the LDB between gps. A Pearson product-moment r was used to determine the relationship between subscales of the LDB. Qualitative anal using categorization and frequency of responses was used on the interview data. Based on the results, choices were important to the Ss and practitioners may be able to use choices to increase clients' perception of enjoyment and control.

82. RILEY, R. An exploratory study of quality assurance methodology in therapeutic recreation using the Delphi technique. Ph.D. in Therapeutic Recreation, 1989, 330 p. (H.M. Lundegren)

Given the increased usage of QA within the health care industry, professional services need to identify and monitor important aspects of clinical care. Two gps of Ss, therapeutic rec (TR) experts (n=51) and Veterans Admin TR administrators (n=71) were surveyed via Delphi technique to determine important aspects of TR service. Spearman rank-order r was used to determine the assoc between importance rankings and actual usage patterns as reported by the 2 gps. Pearson's product-moment r and X_2 were used to test the degree of assoc between S's professional demographic profiles and reported importance and actual usage scores. A sig degree of assoc was found between the experts and VA respondents with respect to the ranking of important TR elements and indicators (27 of 38 r coefs were sig). There was very little stat sig found between demographic profiles and reported importance and usage scores. Conclusions suggest a strong consensus regarding important aspects of quality care among TR experts and practitioners. Findings indicate that a systematic QA plan for TR exists and thus, should be further tested for validity and reliability purposes.

83. VOELKL, J.E. The daily experience of older adults residing in institutional environments. Ph.D. in Recreation and Parks, 1989, 194 p. (R.C. Birkel)

The purpose of the study was to examine the relationship between the objective and subjective aspects of nursing home residents' daily exp. 12 residents shared their daily exp via the exp sampling method (ESM). Each participant carried an electronic paging device for 7 days and filled out a self-report form when signaled at 6 random times each day. Residents responded to 307 of the 412 signals emitted. Prior to completing anal, a principal components anal was computed. Subsequently, two MANOVAs and one ANOVA were computed to examine the relationship between each of the independent variables (i.e., activity, companionship, location, challenge/skill ratio) and the DVs (i.e., Factor 1: affect, freedom, arousal, involvement, wish; Factor 2: concentration, control; Factor 3: choice). Activity was sig related to subjective exp. Companionship was also sig related to subjective exp, excluding the DV of choice. The anal examining the relationship between location and subjective exp revealed few sig findings. Challenge/skill ratio was sig related to subjective exp. Discussion of the study focuses on ways the data provide a more indepth view of daily exp than gained from previous studies and possible limitations of Csikszentmihalyi's (1975, 1982) theory of optimal exp.

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84. CONNELLY, K.A. Factors that predict participation in a worksite health risk assessment program and their effects on risk factor status. MSc in Health, 1988 (G. Hyner)

Demographic and risk factor variables and behavioral risk status were used to predict employee participation in 2 diff phases of a worksite health risk assessment prog (n=434). The 2 phases of the assessment prog were completing a health risk appraisal only, and completing a health risk appraisal plus attending a health exam. Models using demographic variables only, risk factor variables only, and demographic plus risk factor variables were unable to provide a good fit with the data. Change in risk factors for participants of phase 2 for 3 consecutive yrs was also examined (n=31). Sig physical and behavioral changes observed were: increased frequency of seatbelt use, and decreased DBP. No statistically sig changes were observed for frequency of pap smear (F), frequency of breast self-examination (F), physical activity level, serum chol levels, SBP, or body mass index. These findings suggest that pos long-term changes in risk factors are observable in worksite health risk assessment prog that are a part of a comprehensive health promotion prog. Further studies on factors that influence participation in worksite health risk assessment prog are needed.

85. DOLL, M. The kinematic characteristics of the squat clean as a function of classification level. MSc in Physical Education, 1988 (C. Widule)

Film data were collected from the best clean and jerk lift performed by each of 25 Ss. Ss were classified into 5 levels according to US Weightlifting Federation (USWF) criteria. Data were collected during 2 sanctioned USWF meets. Max arm velocity, horizontal bar displacement, vertical bar displacement, max bar velocity, re-orientation time, bar velocity loss during reorientation, catch time, spinal inclination variance during the first pull, and spinal inclination at the catch were calculated. An ANOVA and Duncan's Multiple Range Test were performed on the calculated data to compare classification levels. Although only the range of horizontal bar mvmt was found to be sig ($p<.05$), it was found that novice lifters had the lowest ranking M on 6 out of 9 of the kinematic characteristics.

86. GEUSS, K.S. Dietary correlates of blood pressure and anthropometric characteristics in black and white adults. MSc in Physical Education, 1989 (C.Melby)

352 M and F, black and white Seventh Day Adventist vegetarians (VEG) and nonvegetarians (NVEG) were sampled to examine the influence on race, diet, exercise, and family history on wt and BP. A health questionnaire was admin and BP and anthropometric meas were taken. A 141-food item food frequency questionnaire was use to anal the diets. Nonvegetarians consumed more protein, saturated fats and chol than the VEGs. White VEGs and NVEGs consumed more calcium than black VEGs and NVEGs. Vegetarians consumed more carbohydrates, fiber, potassium, and magnesium that NVEGs. Body mass index was neg correlated with wt loss and diet and pos correlated with chol. Sig neg correlates of waist/hip ratio were yrs of formal educ and pos correlates included potassium and sugar. Pos correlates of triceps skinfold were saturated fat/1000 Kcal, chol/1000 Kcal, wt loss, snacking, stress, and diet. Formal yrs of educ was the strongest neg correlate of waist circumference, while family history of diabetes, diet and wt loss were pos correlates. Multiple stepwise regression anal revealed age and diet to be the 2 best predictors of the anthropometric meas. Simple correlational anal found race and age to be pos correlates of SBP. Race and snacking habits were strong correlates of DBP. Of the dietary variables, only sugar showed a correlation with DBP. Fish consumption showed the strongest pos correlation with DBP and SBP. The dietary variables anal account for little variability in BP between vegetarians and nonvegetarians, and only partially account for diff in anthropometric characteristics of the study sample.

87. GUDURA, C.L. The effects of a relaxation training program on serum cholesterol levels of an active adult population. MSc in Physical Education, 1988 (R. Lyle)

The purpose of this study was to determine the effects of a relaxation training (RT) prog on serum chol (SC) levels of an active adult population. 45 volunteers from the Purdue Adult Fitness Prog completed the study. 22 Ss (11 M, 11 F) volunteered for the relaxation (E) gp and the remaining 23 (12 M, 11 F) served as controls (C). The E gp was given four, 30-min RT sessions, followed by reinforcement sessions once a wk for 13 wks. During the study, both gps participated in a 16-wk long exercise prog that took place 3 times a wk. SC, high density lipoprotein (HDL), low density lipoprotein (LDL), triglycerides, and glucose were meas at the beginning, middle, and end of the study. Resting seated BP was meas bi-weekly. Dietary intake, trait anxiety level, and CV response to a mental arithmetic task were meas pre and post. The gp showed no sig change in biochemical variables over time. However, the E gp showed a sig increase in SC and LDL at midpoint and a sig greater HR response to the mental task. At the end of the exp period, there was no diff in SC levels between the E and C gps.

88. HOEVET, M. J. The effects of aerobic super circuit training on aerobic capacity, body composition and muscular strength in college women. MSc in Physical Education, 1990 (D.L. Corrigan)

The purpose of this study was to investigate the effects of Universal Gym's Aerobic Super Circuit on aerobic capacity, body composition, and muscular strength in 19 coll F 18-25 yrs of age. Prior to the training prog each S performed a series of 4 tests. Aerobic capacity was meas using a bicycle ergometer following ACSM guidelines. Body composition was evaluated by hydrostatic weighing procedures. Muscular strength was determined by 2 methods: first a Cybex II Isokinetic Dynamanometer meas peak torque output (ft.lbs.). of the right quadricep; next, each S performed a 5 rep max lift on the various resistance machines contained in the training circuit. All pre- and post-testing took place no more than 5 days prior to and following a 9 wk training period. The training prog consisted of 3 sessions per wk on the Aerobic Super Circuit. The circuit contains a series of 12 Universal resistance machines and 12 Monarch Exercise Bikes arranged alternately. The circuit was completed twice during each training period and took approx 28 min to complete. Pre- and post-test data were anal using paired t-tests. Mean VO_2max increased 3.78 ml/kg/min following the training period ($p<.05$). M VO_2max in absolute value increased .25 liters per min following the training period ($p<.05$). M % bf decreased less than 1% and was insig. M lean mass increased 2.1 lbs ($p<.05$). Ss sig increased in all strength testing meas. M Cybex quadricep strength at pre-testing was 82.2 ft.lbs. and 90.2 ft.lbs. at the post-test. M total circuit wt lifted for 7 tests was 539 lbs at pre-testing and 688 lbs at post-testing. It was concluded that Universal Gym's Aerobic Super Circuit appears to be an effective means of increasing aerobic capacity and muscular strength. While lean mass increased using the Super Circuit, it's effect on % bf in this study was insig.

89. HUSTON, L.P. The relationship of goal perspective and competitive sport experience to the perceived legitimacy of intentionally injurious acts in football. MSc in Physical Education, 1990 (J. Duda)

The relationship of goal perspective and competitive sport involvement to aggression tendencies was studied among 124 HS and 142 Division III coll football players. Ss responded to questionnaires that examined competitive football exp, goal perspective, or degree of task and ego orientation, and the perceived legitimacy of aggressive acts in football. Simple and multivariate anal suggested that goal perspectives predicted the perceptions of the legitimacy of aggressive acts. Task orientation was neg correlated, and ego orientation was pos correlated with the endorsement of aggressive acts. No sig diff was found between competitive levels for the endorsement of or the willingness to do aggressive acts. However, the HS athletes endorsed more aggressive acts than the coll athletes if the coach requested the behavior. The no. of yrs of participation in football pos related to the willingness to do and the endorsement of intentionally injurious acts. If the coach requested the behavior, the athletes with the greatest exp were less likely to injure an opponent. The no. of yrs of football exp was pos correlated with task and ego orientation. A sig competition level diff was found with respect to goal perspective, i.e., the coll athletes being more task and more ego oriented than the HS athletes. Goal perspectives were found to be a better predictor of the endorsement of and the willingness to commit aggressive acts than the indices of competitive involvement. When the coach requested the behavior, competitive exp proved the better predictor of legitimacy judgments.

90. JOSEPH, D.S. The sociodemographic and perceived health status of health fair (HF) participants, and the effects of the HF on selected health behaviors. MSc in Health, 1988 (G.C. Hyner)

The purpose of this study was to determine the sociodemographic characteristics, perceived health characteristics, and potential influence of the Health Fair (HF) on personal health behavior in a sample of adults who attended a HF in the Tidewater, VA area. An investigation of overall sample characteristics was compared to a national population sample, as determined by the National Health Interview Survey (NHIS). This study also determined the types of HF activities that the participants appreciated or enjoyed the most, the purpose of their attendance, and their awareness of the HF sponsors.

91. KOOYERS, K.J. Social support for married weight reducers: Recipients' perspective on what is helpful. MSc in Physical Education, 1990 (D.R. Black)

This study investigated the relationship between specific functional support behaviors (e.g., esteem support, instrumental support, informational support) naturally performed by the spouse, and the effect they had on the wt reducer. This study also examined the effects of spouse support on S wt variables such as present percentage overweight and weight lost from heaviest to present. An instrument titled the "Survey of Spouse Attitudes and Behaviors (SSAB)" was developed to complete this research. The dev process involved several steps including a review of the lit, specifying the domain, developing items, classifying items, developing scales, interviewing Ss, pilot testing, and analyzing the instrument for item bias. This research study showed that spouse behaviors which provide esteem support (e.g., being proud, complimenting, encouraging) and instrumental support (e.g., helping with food preparation and other tasks, dieting with spouse, being involved, buying clothes) were perceived by Ss as being most helpful in reducing wt. Informational support (e.g., giving information, thinking of things to do instead of eating, observing, confronting) on the other hand, had neither a pos nor neg effect on the wt reducer. A oneway ANOVA of S wt variables by 3 levels of spouse helpfulness showed that those Ss with low spouse helpfulness had sig higher present percentage overweight. Ss with high spouse helpfulness lost sig more wt from their heaviest to their present wt. Regression anal were performed to predict spouse helpfulness, supportiveness, and effectiveness, as well as S wt variables. A factor anal of the 25 SSAB items was also completed to identify the factors or constructs that empirically summarized the instrument. The results of this study demonstrate the potential pos impact a supportive spouse can make on their partner's wt loss efforts. Future research should focus on ways to optimize the quality of spouse support as well as identify what instructional methodology and skill dev techniques are most effective for couples wt loss prog.

92. LARKIN, L.C. The effects of a selected cholesterol screening and cholesterol educational strategies on college freshmen. MSc in Physical Education, 1990 (R. Seehafer)

The purpose of this study was to determine the effects of a cholesterol screening and educ prog on coll freshmen (n=117) at a small liberal arts univ. Specifically, the study investigated the possible impact between 3 various educ approaches following a cholesterol screening to determine changes in student behaviors, attitudes, and knowledge regarding cholesterol and HE. The diff educ strategies involved treatment gp #1 (n=25), blood cholesterol screening only; treatment gp #2 (n=25), blood cholesterol screening with a mail and telephone follow-up; treatment gp #3 (n=29), blood cholesterol screening with an 8 wk healthy lifestyling course. The control gp (n=38) consisted of students enrolled in a freshman psych class. An additional objective was to determine possible gp diff in recorded cholesterol levels for the pre- and post-study screenings. Anal of the data revealed that no sig changes occurred in weekly exercise and snacking, high and low cholesterol/fat food selection behaviors, and predisposing attitudes toward exercise. Sig results, however, were found between and among the treatment gps for cholesterol knowledge. Sig results were also found between and among the treatment gps for blood cholesterol levels. All of the treatment gps exhibited statistically higher cholesterol values at the end of the 8 wk period for the study.

93. LOFTUS, E.A. Design of smoking cessation interventions for college students: Product considerations for social marketing. MSc in Health, 1989 (D.R. Black)

This study identified variables relevant to the design of a coll smoking cessation intervention and evaluated them according to 4 social marketing principles. Data on coll smokers were gathered from 2 consecutive surveys admin to a sample of all full and parttime students at a large midwestern univ. The response rate was 77.3% (n=2,998) for the first survey; 13.3% of the students smoke and 10.4% smoke one or more cigarettes per mo. Response rate for the second survey was 84.0% (n=263) with 194 students still classified as smoking one or more cigarettes per mo. Nonsmoker and smoker demographic comparisons revealed that smokers are sig lower in class rank and tend to live off campus relative to nonsmokers. Gender comparisons revealed that women's participation in a smoking cessation intervention compared to men is affected more by convenient and flexible prog hrs, inclusion of friends in the prog, use of reminders about meetings, and convenience of the intervention's location. Gender comparisons also revealed that men reported a sig higher level of income than the women. Implications for intervention design are presented.

94. LU, F. Comparison of differentiated and undifferentiated ratings of perceived exertion above, at, and below the lactate threshold during cycle exercise. MSc in Physical Education, 1990 (B.J. Noble)

Literature indicates that the lactate threshold (LT) is an important "anchor" point for undifferentiated ratings of exertion (UR). Likewise, UR appear to be linearly related to lactate concentration above LT. Little is known about the responsiveness of differentiated ratings (DR) to changes in lactate concentration. It was hypothesized that DR would not diff from UR at or below LT but above LT where lactate is rapidly increasing local ratings would parallel lactate response. 10 normal Ss, ave age 26.3 yrs and VO_2 max 45.1 ml/kg/min, rode a bicycle ergometer to exhaustion in the first trial and to 95% VO_2 max in the second trial. The first trial was used to determine the aerobic power and the estimated blood sampling points from ventilatory data. Following at least 7 days of recuperation, Ss rode to exhaustion with an indwelling catheter so that blood sampling could be accomplished at various percentages (-20%, -10%, 0%, +10%, +20%) of VO_2 max above, at, and below LT. Mean ratings at LT (61% VO_2 max) were 14.4, 13.6, and 13.2 for local, overall, and central, respectively. Lactate concentration ave 2.53 mM/l at LT. Whereas overall and central ratings exhibited linear responses to exercise intensity, local ratings rose sig ($p<.05$) following LT in parallel with lactate responses. The only sig diff among ratings was found between local and central ratings at +20% above LT ($p<.05$). The only perceptual cue that appears to mimic the lactate response above LT is the local rating.

95. MACKENZIE, P.A. The effects of instrumental and affective support on health behaviors among female and male Ph.D. students. MSc in Physical Education, 1989 (J. Duda)

The purpose of this study was to provide information about the effects of social support on health behavior. Specifically, it compared F and M Ph.D students' perceptions of social support available from faculty, friends, and family and their self-reported health behaviors. Social support was operationalized as instrumental and affective support available from faculty, friends, and family. The health behaviors that were meas were alcohol consumption, sleep patterns, intake of specific nutrients, eating habits, exercise and activity levels, and smoking. Questionnaires were mailed to a random sample of 225 F and 225 M Ph.D. students enrolled at a large midwestern univ. The result of 192 usable questionnaires yielded a response rate of 43% (n=106 F, n=85 M). Anal of the data revealed that although it had been hypothesized that F would perceive less affective and instrumental support available from faculty members no such diff were found. It was also predicted that for F and M the perceived availability of social support would be correlated with the 7 selected health behaviors. For F, sig relationships were found between perceptions of high levels of instrumental support from faculty and high levels of activity and exercise. Sig relationships emerged between an increase in instrumental and affective support from faculty and a decrease in sleep problems among M. For M, there were also sig neg r found between affective and instrumental support from friends and family and degree of alcohol consumption and sleep problems. Further, sig pos r emerged between affective and instrumental support from friends and family and pos eating behaviors among the M doctoral students. The final hypothesis for this study was concerned with the ability of social support to predict health behaviors. Statistical anal indicated that for F, instrumental support from faculty predicted activity and exercise levels. For M, instrumental support from family and friends predicted sleep problems and affective support from friends and family increased pos eating behavior. In predicting the alcohol consumption of M, instrumental support from friends and family and affective support from faculty emerged as important variables. Social support seemed to be more important to the health behaviors of M students than it did to F students. It was proposed that F Ph.D. students expected less support than their M counterparts. If the F did not expect as much support as the M, F may have been better able to adapt to the situations in their departments. Conversely, if M expected more support than they received this could explain the impact that social support had on several of the health behaviors of the M students. Drawing from the present findings, recommendations were made for the field of health promotion and for future research.

96. MROCZKIEWICZ, S.C. Predictors of multidimensional competitive stress among female intercollegiate volleyball players. MSc in Physical Education, 1990 (J.L. Duda)

The purpose of this field study was to examine the situational and intrapersonal variables which predict pre- and post-competitive multidimensional state anxiety among F intercollegiate volleyball players. This study extended previous research by: 1) focusing on F intercollegiate athletes, 2) by investigating acad stress as a possible situational predictor of pre- and post-match stress, and 3) by using both multidimensional state (CSAI-2) and trait (SAS) anxiety meas. 86 F intercollegiate level volleyball players from 9 Midwest univ were tested during their spring season or "off-season." The Ss were admin a dispositional questionnaire during a team practice. Game-specific cognitions and multidimensional state anxiety were assessed 15 min before and immediately following a tournament match. Stepwise multiple regression anal revealed that personal performance expectancies and factors related to expected match outcome were predictors of pre-match state cognitive and somatic anxiety and state self-confidence. Cognitive and somatic trait anxiety emerged as predictors of cognitive and somatic state anxiety, respectively. The major predictors of post-match state anxiety were match outcome, fun experienced, and satisfaction with personal performance. Acad stress did predict of pre-match somatic state anxiety and sig correlated with pre-match state cognitive and state self-confidence. In general, the present results were consistent with previous work. It is suggested that more research needs to be conducted on F intercollegiate athletes during their regular competitive season.

97. PAIK, I.Y. Effects of acute dehydration and subsequent rehydration on metabolic rate in college wrestlers. MSc in Physical Education, 1990 (D.L. Corrigan)

The purpose of this study was to examine the effects of acute dehydration on metabolic rate in coll wrestlers. Ss (n=6) were tested on 2 consecutive days. On day 1, Ss' metabolic rate was meas 3 times; 1) before dehydration; 2) after app a 5% wt loss by thermal dehydration; 3) after rehydration. In addition, core temp and blood volumes were meas during or before each of the metabolic meas. On day 2, metabolic rate and core temp were meas at time periods which corresponded to day 1 but without the dehydration period. Data anal revealed no sig diff in metabolic rate between meas on day 1 and day 2. However, there was a 9% increase in metabolic energy expenditure between the predehydrated and dehydrated state and an 8% increase in metabolic energy expenditure between the rehydration state on day 1 and the first and second metabolic meas on day 2. Core temp remained stable during the predehydration condition (36.5C ± .42) and increased after 150 min of dehydration (37.9C ± .32) and returned to normal within 60 min during the post dehydration metabolic rate meas. There was a sig diff in plasma volume between the predehydration and dehydrated and rehydrated states.

98. RHODES, T.L. Effect of a protein-sparing modified fast on weight loss and resting metabolic rate in men and women. MSc in Physical Education, 1990, (C.L. Melby)

The purpose of this study was to compare the effects of an 11 wk protein-sparing modified fast (420 kcal) on wt loss and resting metabolic rate in obese M (n=5) and F (n=21) aged 22-73 yrs. All meas were taken before wt loss, at the end of the 11 wk fast and again 10 wk later when Ss were on a maintenance diet of 1100-1400 kcal/day. The M had a 19% decrease in RMR during the fast compared to a 16% decrease seen in the F. Both the M and F had an increase in RMR of approx 4% from the end of the fast to the maintenance phase. M lost an ave of 2.5 kg (5.5 lb) per wk while the F lost 1.4 kg (3.1 lb) per wk during the fast. The total mean bw loss was 40.7 kg (91.8 lb) for the M and 18.7 (41.5 lb) for the F. After making adjustments for initial bw, baseline RMR or both, wt loss remained greater for the M. Therefore, in response to an 11 wk protein-sparing modified fast, the M were considered more successful at losing wt than the F.

99. TOM, D.R. A test of a method and apparatus for the estimation of human body composition. MSc in Physical Education, 1988 (D. Corrigan)

It has been known for some time that accurate assessment of body composition can be a valuable aid to both the health practitioner and the athletic trainer. There are many methods of assessing body composition with hydrostatic being the "gold standard" upon which the accuracy of the other methods is judged. Hydrostatic weighing determines body composition by meas body volume utilizing Archimedes' Principle. Total body volume is then used to calculate body density and thus body composition is estimated. This project involved the design and test of an instrument to directly meas the volume displaced when a body is submerged in a small hydrotherapy tank. It was hoped that this method of meas body volume would be more convenient and less expensive than hydrostatic weighing. The new instrument worked well when meas inanimate objects, but the accuracy when used on human Ss was not established. 9 Ss of varying body composition were meas on 3 separate occasions. Body composition was determined both by hydrostatic weighing and displacement anal. Although the precision of both methods was established, displacement anal did not agree with hydrostatic weighing when an ANOVA was performed (f=2.7). The error was hypothesized to be in the methods used when meas human Ss.

100. ZHANG, Y. An examination of the influence of practice schedule on motor performance. MSc in Physical Education, 1989 (H.N. Zelaznik)

The effect of contextual interference (CI) has attracted considerable attention in both verbal and motor learning research. A common phenomenon is that a high CI acquisition (random practice of tasks) condition will lead to the decrement in acquisition performance, but facilitate retention and transfer compared to a low CI (blocked practice of tasks) condition. Many studies have been conducted to test this phenomenon. Recently, two theoretical frameworks have emerged to explain this phenomenon. One is the forgetting theory, which stresses that the occurrence of forgetting provides a chance for S to undergo more problem-solving processing. The other is the elaborative/distinctive theory, which emphasizes that the repeated interaction with to-be-learned material will result in a distinctive encoding, thereby enhancing memory. This study was more interested in a methodological problem involved in related studies that the diff retention intervals of several acquisition tasks might have some influence on the transfer or retention performance. Therefore, in the present exp, two more practice conditions were included which involved both blocked and random trials in order to compare with the total blocked and total random conditions. The focus was whether these 12 random trials added after the blocked trials would wipe out the transfer or retention diff usually found between blocked and random gps. 48 M and F student volunteers served as Ss. 3 acquisition tasks were practiced with 2 transfer tasks in the study. The MT was recorded and transformed to deviation scores—AE. The results did not show clear effects of CI in both acquisition or transfer performance. The diff retention interval might not be a crucial determinant of better or poorer transfer performance, at least in this study, because the blocked gp almost transferred as well as or better than the random and blocked/random gp. Therefore, the original 2 hypotheses were rejected by the results. The failure to detect the effect of CI might be attributed to the issue of breadth of practice as suggested by Pigott and Shapiro (1984).

SAN FRANCISCO STATE UNIVERSITY **(B. BATES)**
SAN FRANCISCO, CALIFORNIA

101. CRABB, R.C. A survey of injuries among competitive women bodybuilders. MA in Physical Education, 1990

A questionnaire concerning training habits and training induced injuries was mailed to the entire population of the Women's Bodybuilding Division of the Northern CA Amateur Athletics Union. Response rate was 52%. Wt training exp of Ss varied from less than 7 mos to more than 72 mos. The ave length of a training session was 87.6 min and 5.2 training sessions were ave per wk. A pos r existed between the no. of training sessions per wk and the no. of injuries incurred during training. 44% of respondents were injured. The shoulder, elbow, and low back were the most injured body sites. Muscle strains and tendinitis were the most common types of injury. Anal of frequencies between source of injury diagnosis and length of discontinuance of training was statistically sig. Separate comparisons of stretching, warm up, and cool down to injury status revealed no sig diff from those which would be expected by chance.

102. DAVIS, R.M. The development, implementation, and evaluation of a training program for staff nurses in the treatment of hypersensitivity reactions to I.V. drugs and blood products. MSc in Health Education, 1988

An educ module to train the registered nurses in the treatment of hypersensitivity reactions to I.V. drugs and blood products was designed, implemented, and evaluated. The study's population included 20 staff nurses who attended the 4 hr educ prog and who took the prog posttests. To evaluate the effectiveness of the educ prog, knowledge and psychomotor performance levels were determined. Knowledge levels were meas by a 32 item, multiple-choice written test. Psychomotor performance levels were rated according to competency evaluation checklists. The instruments were piloted prior to the educ prog for reliability estimates. A passing score of 80% was determined for both the cognitive and psychomotor performance posttests. The reliability estimate of the cognitive posttest using the Kuder-Richardson reliability coefficient was 0.82. ANOVA was used to anal the psychomotor performance posttest scores and was sig at the .05 level. Since only 8 staff nurses (40%) achieved a passing score on the cognitive posttest, and only 12 staff nurses (60%) achieved a passing score on the psychomotor performance posttests, one could conclude the course objectives were not met. Based upon these results, one may conclude the educ prog did not meet the requirements of the hospital. Recommendations for modification of the educ module are presented.

103. ELDRIDGE, M.E. The development, implementation, and evaluation of a training program for selected nurses on a cardiac surveillance unit of the specialized standard procedure for the emergency use of the Pace-Aid. MSc in Health Sciences, 1989

The study involved the dev, implementation, and evaluation of a training prog on the Pace-Aid, an external cardiac pacemaker for emergency use, for nurses on the Cardiac Surveillance Unit of Sequoia Hospital in Redwood City, CA. 34 RNs took part. The prog was implemented as one part of a 2 day review/update course regularly scheduled for CSU nurses each yr. A written, multiple choice pre- and posttest was utilized for the evaluation of cognitive abilities. Psychomotor skills were meas by the use of an absolute rating scale dev by the author in conjunction with pacemaker experts. Cognitive testing reliability was found to be .73 on the pilot test and .70 on the posttest. The t-test for dependent samples was chosen to show the relationship between the pre- and posttest scores and was found to be statistically sig. The psychomotor scores were compared to those of the cognitive posttest using the Pearson rho formula. The r proved not to be statistically sig at the .05 level. It was found that knowledge was indeed enhanced following the training prog. 82% of the participants obtained passing scores on the posttest compared to 52% passing grades on the pretest. Skill testing revealed, however, that only 68% of the participants obtained passing grades following the prog. Therefore, it was recommended that the time allotted for psychomotor activities be increased and that this prog be repeated at least yearly as part of the CSU review/update classes.

104. KUNITA, C. The development, implementation, and evaluation of a training program for staff nurses in the performance of selected respiratory therapy techniques. MSc in Health Education, 1987

An educ prog to train staff nurses to perform selected respiratory therapy techniques was designed, implemented, and evaluated. The researcher collaborated in this process with members of the multi-disciplinary task force formed to plan, implement, and evaluate the educ prog. The study was conducted at a 240 bed acute care hospital in San Francisco, CA. The study's population included 25 medical-surgical staff nurses who attended the 8 hr educ prog and who took a pretest, immediate posttest, and a 1 mo follow-up posttest. To evaluate the effectiveness of the educ prog, knowledge and psychomotor performance levels were determined. Knowledge levels were meas by a 40 item, multiple-choice written test. Psychomotor performance levels were rated according to a competency evaluation checklist. The same instruments were used to obtain pretest, immediate posttest, and 1 mo follow-up test scores. Statistical anal of the 3 cognitive test scores and the 3 psychomotor performance test scores were calculated through the use of a statistical computer program. A 1 way ANOVA-Repeated Meas technique was used to anal the variance of the M of the cognitive scores and the M of the psychomotor performance scores. The computed F ratio for the cognitive scores and for the psychomotor performance scores was 121.741 and 135.258 respectively. These values were larger than required (3.130) at the .05 level of sig. It may therefore be concluded that the variation among the m of the 3 cognitive tests and the 3 psychomotor tests was not due to sampling error or to chance factors but to the effectiveness of the educ prog. There was sig learning between the admin of the pretest and the immediate posttest with some overall decline in achievement levels between the immediate posttest and the 1 mo follow-up posttest.

105. O'CONNOR, M. The development, implementation, and evaluation of a training program in the advanced principles of trauma nursing. MSc in Health Education, 1987

The study was undertaken to dev, implement, and evaluate a 2 day training prog for emergency dept, operating room, and intensive care unit nurses responsible for the initial assessment and stabilization of trauma patients during the first hr postinjury. 23 staff nurses at a hospital north of San Francisco participated in the prog. The one gp, pre-test, post-test research design was utilized. It was found that a statistically sig increase in knowledge and motor skills occurred in the target population. It is recommended that future prog should include a provision for follow up and that such prog should be adopted as a regular part of emergency nurse training.

106. ROTH, R. Comparison of use of the problem list in ambulatory medical records before and after establishment of documentation guidelines. MSc in Health Sciences, 1988

The purpose of the study was to compare the documentation of ambulatory care health problems on the Problem-Oriented Medical Record Problem List, before and after establishment of charting guidelines, to determine if documentation improved. This was done by conducting 3 medical record audits, investigating whether the Problem Lists contained notation of the health problems with implications for ongoing care that should be noted on the Problem List. The first audit was conducted before documentation guidelines were dev, the second audit after guidelines had been established, and the third audit 3 mos after the second. The results of the first audit showed a 21% documentation level, rising to 60% on the second audit and 65% on the third audit. Anal of the change in documentation levels by the clinicians using the Sign test showed a statistically sig improvement at the .05 level, lasting through the third audit. It was therefore concluded that the documentation guidelines provided the basis for clinician improvement in Problem List documentation in this study.

SLIPPERY ROCK UNIVERSITY (F.J. BRANNON)
SLIPPERY ROCK, PENNSYLVANIA

107. ADAMS, D.J. An investigation of the relationship between women's internal anxiety trait and the competitive anxiety state as a result of anxiety factors that occur before a perceived basketball contest. MEd in Physical Education, 1989, 57 p. (J.L. McKeag)

The purpose of this study was to investigate the relationship between a women's internal anxiety trait and competitive anxiety state as a result of anxiety factors that occur before a perceived basketball contest. The investigation included 69 F coll BB players competing during the 1987-88 season at 10 selected coll and univ in PA. The Trait Anxiety Inventory developed by Spielberger (1966) and the Illinois Competition Questionnaire developed by Martens (1977) were completed by the Ss. A Pearson Product-Moment Correlation was the statistical method used to compare the mean scores of the Trait Anxiety Inventory to the mean scores of the Illinois Competition Questionnaire. Results of the investigation indicated that a sig relationship (r=.424) existed between the anxiety trait and the competitive state for the 69 Ss in this study.

108. ALDRICH, G.M. A comparison of selected kinematic parameters of two foot actions in the power position of the shot put. MS in Science of Exercise and Sport, 1989, 70 p. (N.K. Ng)

The two foot actions were a heel pivot technique and a nonheel pivot technique of the drive leg. The variables examined were the velocity at release, ht of release, angle of release, distance the shot was thrown, the vertical velocity of the body's CG at release, the horizontal velocity of the body's CG at release, and the acceleration of the body's CG at the time of release. 7 Ss, members of the Slippery Rock Univ Track and Field team, were used for the investigation. Cinematographical, digitizing, and computer techniques were used to anal the data for the mechanical description of the foot action in the power position of the drive leg. A rank test for 2 correlated samples, Wilcoxon Matched-Pairs Signed-Ranks test was used as the test for sig for each research hypothesis. The results of this study indicated there was no sig diff between the heel pivot technique and the nonheel pivot technique with respect to the kinematic parameters which were chosen for this study.

109. CUNNINGHAM, S.D. A comparison of static stretching and tension reduction stretching for improving hip joint flexibility. MA in Exercise Science, 1989, 43 p. (W.P. Hotchkiss)

The purpose of this study was to compare the effects of static stretching and tension reduction stretching for improving low-back and hamstring flexibility about the hip joint. The Ss were 44 F gymnasts ranging in age from 13 to 18, from Pace Academy in Atlanta, GA. The Ss were randomly selected and placed in 1 of 3 gps, static stretching, tension education, or a control gp. Gp A was the control gp. This gp was pretested and posttested with no intermittent treatment. Gp B was the static stretch gp which used a stretch stimulus of 25 sec. Gp C represented the tension reduction gp which also had a 25 sec stretch stimulus during which static, isometric, and isotonic contractions were used to stimulate muscle stretch. A total of 24 stretching sessions were held for each exp gp. During this time there were three 25 sec duration of stretch stimulus per leg, totaling 75 sec for each leg each session. The statistical tool used in the study was ANCOVA. It was statistically concluded that neither stretching technique had a pos or neg effect in increasing hip joint flexibility.

110. KIRCHER, W.T. Effects of training with and without the lung trainer upon lung function and cycling performance. MS in Exercise Science, 1990, 49 p. (G.S. Pechar)

8 Ss, M, age 24.3 (range 19-34 yrs), completed the 6 wk training prog either with or without the Lung Trainer. A Vanguard Electronic Spirometer evaluated respiratory function while the combination of Racermate Piggyback windload simulator and Cateye Solar cyclocomputer determined 5 mi cycling performance. Training sessions lasting approx 1/2 hr were conducted 3 day/wk. On the lst day, a progressive series of 6 2-min intervals were performed at 110% of their ave 5 mi windload speed. On the 2nd day, an aerobic ride was interspersed by cycling jumps of 10 sec. On the final day of each wk, 2 1-mi and 1 2-mi timed trials were performed. The diff between each S's pre and post-training respiratory and cycling performance results were used in the statistical anal. The results of the Mann-Whitney Test indicated all respiratory and cycling performance meas displayed nonsig diff between the cont and exp gps. It was concluded that usage of the Lung Trainer has no effect upon resting lung function and exercise performance.

111. RICHTER, K.W. A comparison of the cumulative grade-point averages of male scholarship athletes to male nonathletes at Clarion University of Pennsylvania. MEd in Sports Study, 1989, 65 p. (J.L. McKeag)

The study consisted of M scholarship athletes and nonathletes who entered Clarion Univ of PA in 1980, 1981, and 1982, and who graduated within 5 yrs. The 59 student-athletes who qualified for inclusion in the study by meeting the established criteria participated competitively for 4 yrs in one of the 4 scholarship sports at Clarion Univ of PA. The sample of the 59 M nonathletes was matched within 10 points of the composite SAT score to each of the 59 M athletes. A dependent t-test for matched pairs was utilized to anal the diff between the mean cumulative GPA of the student-athlete gp and the mean GPA of the nonathlete gp. The results indicated no sig diff between the 2 gps when matched by the SAT. The student-athletes' mean GPA was 2.617, while the nonathletes' mean GPA was slightly higher at 2.732. A chi square test indicated that the distribution of acad majors selected by athletes demonstrated no sig diff from those selected by nonathletes.

112. STEWART, R.L. A study of the perceived opinions of the participants in the Pennsylvania coaching certification program, 1984-1989. MS in Physical Education, 1989, 81 p. (W.L. Herman)

135 participants (73 M, 62 F), between 20-40 yr, who completed the PA coaching certification prog at Slippery Rock Univ were surveyed by means of a questionnaire to determine the importance of a certification prog on interscholastic athletics. Descriptive anal was performed on data collected from 52 respondents (25 M, 27 F). Results indicated that 86% of the respondents were satisfied with information acquired through the prog. 64% of the respondents indicated that the present professional preparation status of interscholastic coaches needs to be improved. 86% were in favor of reinstating the prog, and 87% indicated a desire to recommend the prog to prospective coaches. The respondents recommended that the 6 coaching certification standards were necessary for a quality prog. Furthermore, the respondents indicated that the certification of all coaches would improve the safety aspects of all athletic prog.

113. STOVER, E.M. A comparison of the degree of burnout between paramedics servicing urban and rural areas. MS in Exercise Science, 1989, 103 p. (P.A. Zimmerman)

The Maslach Burnout Inventory (MBI) was used to compare the degree of burnout between 80 paramedics who service rural areas and 79 paramedics who service urban areas in Western PA. A 2 sample t-test was utilized to identify any diff in each subscale of the MBI including: Emotional Exhaustion, Depersonalization, and Personal Accomplishment. All 3 subscales were found to be sig diff at P=.05. The Everly Stress Scale Inventory (ESSI) used 3 subscales to meas stress arousal, depression, and stress related symptoms. The ESSI was also anal using a 2 sample t-test. No sig diff was found in any of the subscales of the ESSI. In addition, stressors that were identified by the paramedics were listed and compared. No sig diff was identified between the paramedics. The anal of data revealed that although stress levels of the paramedics were relatively the same, paramedics who service urban areas do not have the necessary time to recover from the stress and therefore burn out at a faster rate than paramedics who service rural areas.

114. WARD, M.R. The effects of a water exercise program upon the flexibility of older adults. MS in Exercise Science, 1989, 51 p. (H. Knierim)

22 older adults of age 60 and over served as Ss in this study. An exp gp of 10 Ss, 5 F and 5 M, participated in a 10 wk water exercise prog twice a wk for 45-min sessions. A control gp of 12 Ss, 8 F and 4 M, did not participate in an organized physical activity prog for the 10 wk period. All Ss were pretested and posttested on the Modified Sit and Reach Test which meas lower back and hamstring flexibility and on the Leighton Flexometer which meas shoulder flexibility. Data were anal utilizing a Wilcoxon Matched Pairs Test for dependent samples to determine if any sig diff existed between the pretest and posttest scores. The results revealed that the exp gp showed a sig increase in lower back and hamstring flexibility (1.5 in) as well as shoulder flexibility (12°). The control gp showed no sig diff in lower back and hamstring flexibility (.55 in) or in shoulder flexibility (-1.67°). Results conclude that a water exercise prog is effective in sig increasing the flexibility of older adults.

SMITH COLLEGE (D. SIEGEL)
NORTHAMPTON, MASSACHUSETTS

115. GEHRING, M.M. Physiological responses to deep water running in competitive and noncompetitive runners. MSc in Physical Education, 1990 (B.A. Keller)

This study compared the physiological effects of deep water running (DWR) with and without the use of a buoyancy compensating device (BCD) in comparison to treadmill running (Tm). 7 F competitive runners (CR) (M ± SD: age=19.7 yrs ± 0.76, ht=168.1 cm ± 7.29, wt=57.6 kg ± 4.99) and 7 F noncompetitive runners (NR) (M ± SD: age=19.4

yrs ± 0.98, ht= 167.8 cm ± 2.16, wt= 65.5 kg ± 4.88) served as Ss. The CR group had a sig greater training volume ($p<0.01$) and a higher VO_2 max ($p<0.05$) compared to the NR group. Submax running was performed under three conditions: 1) Tm, 2) DWR without a BCD (NV), and 3) DWR with a BCD (V). Ss ran at a self selected pace that was characteristic for a 45 min training run. Submax VO_2, HR, VE, respiratory exchange ratio (RER), and RPE were compared between conditions (Tm, NV, V) for both gps (CR, NR). The CR gp had a sig lower HR (13%) during the V condition compared to the Tm condition ($p<0.05$). This was the only sig diff between conditions for the CR gp. However, the V condition elicited consistently lower physiological and perceptual responses for the CR gp ($p>0.05$). During the NV condition, VO_2 was 3% higher than the Tm condition and 15% higher than the V condition ($p>0.05$). For the CR gp, VO_2 was 13% higher during the Tm condition compared to the V condition ($p>0.05$). The NR gp had a sig lower VO_2 (27%), HR (23%), VE (26%), and $\%VO_2$max (27%) during the V condition compared to the Tm condition ($p>0.05$). During the NV condition, the NR group had a sig lower VO_2 (13%), $\%VO_2$max (13%), and a sig higher RPE (21%) compared to the Tm condition ($p<0.05$); and a sig higher VO_2 (16%), HR (15%), VE (24%), RPE (14%), and $\%VO_2$max (16%) during the NV condition compared to the V condition. The competitive runners in the present study exercised at an intensity (63.4% VO_2max) during Tm running, and DWR with and without a vest, that was sufficient to elicit a cardiorespiratory training response. In contrast, the noncompetitive runners exercised at a sig lower intensity during DWR with and without a vest compared to Tm running ($p<0.05$). The exercise intensity of this gp during DWR with a vest was the lowest of all three conditions ($p<0.05$) and represented the minimum intensity to elicit a cardiorespiratory training response (49.7% VO_2max). The results of this study indicate that competitive runners elicit similar energy expenditure during DWR and Tm running, while noncompetitive runners elicit sig lower energy expenditure during DWR compared to Tm running.

SOUTHEAST MISSOURI STATE UNIVERSITY (R. KIRBY)
CAPE GIRARDEAU, MISSOURI

116. OTTE, R.A. Effects of isotonic and plyometric training on upper body power of ninth and tenth grade males. MA in Secondary Education with emphasis in Physical Education, 1989, 80 p. (J.E. Schneider)

The purpose of this study was to determine if a sig diff in power gains existed between a wt training prog and a wt training prog combined with upper body plyometrics. The Ss included 21 M 9 and 10 grade students from New Madrid Co Central and 41 M 9 and 10 grade students from Cape Central HS. The Ss were randomly assigned to a wt prog or a wt prog combined with upper body plyometrics. The Ss were admin the seated medicine ball put to meas upper body power. The Ss participated in 10 wks of wt training on Mon, Wed, and Fri. During wks 7 through 10, in addition to the routine workouts, the Ss participated in additional training on Tues and Thurs. The investigator concluded that the exp gp showed a sig gain in power compared to the control gp. The combined Cape Central gps showed a sig gain in power compared to the New Madrid Co Central gps.

117. OTTE, S.F. The relationship between parental attitudes toward physical activity and the present fitness state of third, fourth, and fifth grade children. MA in Secondary Education with emphasis in Physical Education, 1989, 93 p. (R.F.Kirby)

The purpose was to examine the relationship between parental attitudes toward physical activity and the fitness of children. The Ss were 40 children in grades 3, 4, and 5 at Parma Ele and their parents. The children were admin the Physical Best Test and their parents completed the Kenyon Attitude Toward Physical Activity Inventory. The Pearson Product Moment Correlation Method was used to anal the data. The results were as follows: 1) There was no relationship between the parents' attitudes toward physical activity and their children's fitness state. 2) There was no relationship between the parents' attitudes and their daughters' individual fitness subtest scores. 3) There was no relationship between the mothers' attitudes and their sons' individual fitness subtest scores. 4) There was a moderate relationship between the fathers' attitudes and their sons' body composition and flexibility. It was concluded that the parents did not influence the children's physical fitness; however, the fathers did influence the sons' body composition and flexibility.

SPRINGFIELD COLLEGE **(J. GENASI)**
SPRINGFIELD, MASSACHUSETTS

118. ACAMPORA, A. The test-retest reliability of the Dynatron 2000. MS in Health Science, 1989, 48 p. (C. Redmond)

The Dynatron 2000 is an isometric testing device designed to assess the physical capabilities of manual material handlers. Being new on the market, the Dynatron 2000 had limited research to determine its reliability or validity. This study was designed to evaluate the test-retest reliability of the Dynatron 2000. The purpose was to determine whether the Dynatron was consistent in what it meas on a day to day basis. Without this consistency the Dynatron could not become a vital physical capacity testing device. The Ss for this investigation were 12 M and 28 F from the Springfield, MA area. The M age for both M and F was 23. The M hts for M and F were 70 in and 65 in, respectively. All 40 Ss were tested isometrically using the low back strength test on the Dynatron 2000. Each S was allowed 2 bouts on each of the 2 test days. The ave of the 2 bouts from test day 1 was the score for test day 1. The ave of the 2 bouts on test day 2 was the score for test day 2. A Pearson Product-Moment Correlation Coefficient was used to determine the relationship between the scores from test day 1 and those from test day 2. The r was determined to be .96, indicating that there was a sig ($p<.01$) pos relationship between the Dynatron 2000 strength test scores from day 1 and those from day 2.

119. BIRCHALL, W. A comparison between Flexmate and static stretching techniques for increasing flexibility of the hamstrings and hip adductors. MS in Movement Science, 1989, 68 p. (C. Redmond)

Ss for this study were 23 M and F students from Springfield Coll. They were randomly assigned to a Flexmate or static stretching gp. Exercises performed in both gps were designed for increasing flexibility of the hamstrings and hip adductors. The Ss in each gp performed the exercises 5 times a wk for 1 mon. An ANCOVA was utilized to anal the data. No sig diff ($p>.05$) were found between pre- and posttest scores for the hamstrings and hip adductors for the static or Flexmate gps. However, there was a sig diff ($p<.05$) in hamstring pretest flexibility scores for the Flexmate and static gp.

120. CHOW, B.C. A comparison of role perceptions of a successful physical educator among physical education majors, teacher educators, and physical education teachers in Hong Kong. MS in Physical Education, 1989, 98 p. (G. Brockmeyer)

Ss for this study were 79 first yr PE majors, 58 final yr PE majors, 9 teacher educ in coll of educ, and 80 inservice physical educ in Hong Kong. The meas instrument used in the study was the PE Role Perception Instrument (Edwards, 1983) which contains 25 statements of characteristics associated with successful teaching in PE. The Ss were required to rank order the statements from 1 to 25 on a most important to least important continuum. The Kendall's Coefficient of Concordance (W) was computed to determine the extent of the overall agreement in the rankings of the 25 statements among (a) first yr majors, final yr majors, and established teachers; and (b) first yr majors, final yr majors, established teachers, and teacher educ. The Ss classified within (a) and (b) on the whole shared similar perceptions about the characteristics that contribute to successful teaching in PE. The Kruskal-Wallis H test was used to compare the diff in rankings for each of the statements among the gps listed under (a) and (b). For the gps listed under (a), the rankings of 10 statements out of 25 were diff. First yr majors shared similar perceptions with the final yr majors while great disparity existed between the perceptions of first yr majors and inservice teachers. For the gps listed under (b), the rankings of 12 statements out of 25 were diff. On the whole, some disparity of perceptions of the characteristics that contribute to success in teaching existed between teacher educ and PE majors, as well as between teacher educ and established teachers.

121. COLEMAN, D. The validity of the bio-electrical impedance estimation of percent body fat relative to age. MS in Movement Science, 1988, 114 p. (S. Siconolfi)

The purpose of the study was to determine the validity of the RJL Bio-electrical Impedance (BIA) prediction of % bf relative to age. Ss included 59 M and 60 F who were equally divided into the following age gps: 9-19 yr; 20-29 yr; 30-39 yr; 40-49 yr; 50-59 yr; and 60+ yr. Underwater weighing (UWW) utilizing functional residual capacity (FRC) as the lung correction volume was used as the % bf "gold" standard. The equation developed by Lukaski et al. (1986) was utilized for the BIA prediction of % bf. r and SEE were used for statistical anal. Ss data were subdivided by (a) age, (b) gender, and (c) age and gender. Sig r (SEE) between UWW and BIA were derived for the F 20-29 yr and 30-39 yr age gps, and M 30-39 yr age gp. The respective r (SEE) for these gps were .862 (1.2%), .875 (1.49%), and .920 (1.3%). Additional equations utilizing the variables ht^2/I, wt, BIA % bf, age, and age^2 were dev via multiple regression. The variables BIA, % bf, age^2, and wt derived the highest r (SEE) between UWW and BIA for the total F populations. The variables ht^2/I, wt, and age derived the highest r (SEE) between UWW and BIA for the total M population. The respective r (SEE) for the populations were .877 (4.7%) for the F and .879 (4.3 kg) for the M. r varied widely between age gps for all equations. It was concluded that the RJL Bio-electrical Impedance was not an accurate method for the prediction of % bf in M and F 9 to 79 yrs of age. It was speculated that other biological, physiological, and/or environmental factors influence the BIA accuracy.

122. CROSS-TROCZYNSKI, A. Women's roles in selected twentieth century American literature utilizing sport themes. MS in Physical Education, 1989, 63 p. (J. Genasci)

This study examined the portrayal of women in selected American novels which used sport themes and were written by men. The time frame was delimited to the twentieth century. The novels selected were The Great Gatsby (Fitzgerald, 1925), The Sun Also Rises (Hemingway, 1926), The Natural (Malamud, 1952), Goodbye, Columbus (Roth, 1950), Rabbit, Run (Updike, 1960), Mortal Stakes (Parker, 1975), and Ironweed (Kennedy, 1979). It was hypothesized that this selected "sport" fiction produced during this century would reflect the trends of the times. This hypothesis was tested by anal some of the changes in women's roles in sport fiction, and thus, in society, in the twentieth century. We are left with the consensus that sexism exists in both society and in the lit which represents our nation. Lit selected for this study represents several decades within the defined time frame, and despite changes occurring within our society during that period, such changes have not necessarily been translated into our lit. This may be due to the entrenchment of sport in the patriarchal design or a lack of change within sport lit. Only one F character within these seven literary works exemplified a changing role within our society.

123. DE PAULIS, T.A. The effects of two types of exercise programs upon the long bone growth of immature rats. MS in Movement Science, 1989, 89 p. (H. Scheuchenzuber)

Ss for this study were 24 immature M Long Evans rats that were 26 days old on the day the study was initiated. The Ss were randomly divided into 3 gps: runners, swimmers, and sedentary (control). Exercise sessions for the runners and swimmers were held 55 times over 92 days. The sedentary Ss were not removed from their cages during this time. The Ss were sacrificed when they were 117 days old and the following meas were taken: left and right femur lengths, left and right femur widths, left and right tibia lengths with epiphyses, left and right tibia lengths without epiphyses, left and right tibia widths with epiphyses, and left and right tibia widths without epiphyses. ANOVA were utilized to anal the data, followed by a Scheffe's multiple comparison test if an F ratio was sig. No diff ($p>.05$) were found among the 3 gps in left tibia width without epiphysis and right tibia width with or without epiphysis. There were diff ($p<.05$) among the 3 gps in all of the other meas. The swimmers had shorter and narrower bone lengths and widths than those of both the runners and the sedentary Ss or of either the sedentary Ss or the runners.

124. DAVIS, J.C. The effect of active hold-relax and passive stretching programs on rotator cuff flexibility. MS in Health Science, 1990, 122 p. (C. Redmond)

Ss for this study were 24 M students enrolled in a PE volleyball class. They were randomly assigned to an active hold-relax or passive stretching prog. The Ss in the active hold-relax stretching gp completed 5 shoulder stretches, 3 times a wk for 6 wks.

The stretching technique involved the S performing a 5 sec static contraction against resistance followed by a 5 sec relaxation, completed 3 times for each stretch. The Ss in the passive stretching gp completed the same 5 stretches, 3 times a wk for 6 wks. The stretching technique involved the S remaining completely inactive as his partner moved his shoulder through the stretch. All Ss were meas for internal and external rotation at the end of each of the 6 wks. The instrument used was a Leighton flexometer. The Ss were meas 3 times for each motion and the M of each motion was considered the flexibility for that session. Two 2 x 4 ANOVAs with repeated meas on one factor were used to anal the data. No sig ($p>.05$) diff was found between the two stretching prog for either internal or external rotation rotator cuff flexibility. There was a sig ($p<.05$) increase in both internal and external rotation rotator cuff flexibility for both stretching prog over the 6 wks. No sig ($p>.05$) interaction was found between stretching gp and wk tested with respect to internal or external rotation rotator cuff flexibility. It was concluded that both internal and external rotation rotator cuff flexibility is expected to be similar after a 6 wk active hold-relax stretching prog or a 6 wk passive stretching prog.

125. DRAGONETTI, J.L. *A biomechanical comparison of the consecutive back handspring and the consecutive front handspring in gymnastics*. MS in Movement Science, 1989, 84 p. (H.J. Scheuchenzuber)

Ss for this study were 6 M coll gymnasts. Each S was filmed performing 5 trials of both the consecutive back handspring (CBH) and the consecutive front handspring (CFH). The best 3 performances of each were used for anal. Separate 2 x 3 ANOVA with repeated meas on both factors (handspring conditions and trials) were used to determine whether diff existed in the following DVs: shoulder, hip, knee, and ankle angles at 9 similar positions; hand contact time; and angles of projection from the hands and feet. Repeated meas t-tests were used to determine whether there were changes in momentum during performances of the 2 types of handspring, and a Pearson product-moment r was computed to determine the relationship between the horizontal velocity curves. The M shoulder and hip angles for the CBH were greater ($p<.05$) than those for the CFH at the midpoint of hand support. M ankle angles for the CBH at initial foot contact, hand take-off, and second foot contact were less ($p<.05$ than those for the CFH at second foot take-off, initial hand contact, and initial foot take-off, respectively. M ankle angles for the CBH at the first foot take-off and max hip ht of the first flight were greater ($p<.05$) than those for the CFH at initial foot contact and max hip ht of the second flight, respectively. There were no diff ($p>.05$) in knee angles, hand contact times, or angles of projection from the hands and feet. There was no change ($p>.05$) in momentum during the performance of the CBH but there was a loss

($p<.05$) of momentum during the performance of the CFH. The patterns of the horizontal velocity curves were similar for the CBH and the CFH. It was concluded that the skills were more similar than diff.

126. GAROFOLI, E. The influence of a walking program on the body cathexis and self-esteem of adult sedentary women. MS in Health Science, 1990, 107 p. (M. Murray)

Ss for this study were 22 F volunteers from CT Mutual Life Insurance Co in Hartford, CT. They were randomly assigned to either an exp gp or a wait-listed control gp. The Ss in the exp gp participated in a walking prog according to the Rockport Walking Institute protocol 3 days per wk for 10 wks. The control gp was not involved in any activity, but was given a walking prog at the conclusion of the study. The Body Cathexis Scale and the Rosenberg Self-Esteem scale were admin at pretest and posttest levels. ANCOVA was used to anal the influence of walking for each DV. Pearson product-moment r were used to test the relationship between body cathexis and self-esteem at pretest and posttest levels. No sig ($p>.05$) diff were found between the 2 gps for either body cathexis or self-esteem scores. There was a sig ($p<.05$) relationship between body cathexis and self-esteem.

127. HOUSEMAN, D.G. The assessment of a swimming protocol to estimate intensity using target heart rates of recreational swimmers. MS in Health Science, 1989 (P. Hutchinson)

Cruise Interval Training (CIT) has been used by coaches to train competitive swimmers. The purpose of this study was to apply CIT to fitness swimmers. Two swim tests consisting of 10 consecutive intervals (length: 50 yd) were performed by 22 fitness swimmers at an intensity of 80%. Time and HR were recorded. Ss were encouraged to swim at an intensity to achieve 80% of age predicted max HR during the first test. The total time of the first test (+10+10sec) was used to determine the pace for the second test. Statistical anal (repeated meas ANOVA) revealed that there were sig ($p<.05$) diff among the Ss' HR within the first swim interval. This finding suggests that steady state had been achieved by the Ss after the first interval. A test of proportions was calculated to determine if the M HR of at least 80% of the Ss was $\geq$60% of his/her age predicted max HR during the second test. The findings of the test revealed that 95% of the Ss attained 60% of his/her max HR. It was concluded that there was no sig ($p\geq.05$) diff among the HR for fitness swimmers using the CIT method, and that this protocol could be used by fitness swimmers to attain target HR for the purpose of achieving better fitness levels.

128. LOUIE, L. Knowledge of prevention and care of athletic injury among the physical education teachers, nonphysical education teachers designated as coaches, and voluntary coaches in Hong Kong secondary schools. MS in Physical Education, 1989, 95 p. (B. Jensen)

Ss for this study were 305 practicing PE teachers, non PE teachers designated as coaches, and voluntary coaches in Hong Kong secondary schools. A Modified Inventory of Recent Knowledge in PE (Rowe & Robertson) was utilized to determine the diff of the current knowledge of prevention and care of athletic injury (a) among the practicing PE teachers, non PE teachers designated as coaches, and voluntary coaches; and (b) between M and F Ss. A 2 x 3 ANOVA with two independent gps factors and the REGRESSION prog with coded vectors for the weighted means anal from the Statistical Package for Social Science (SPSSX User's Guide, 1986) was computed for the test scores. The PE teachers were found to be able to score better ($p<.05$) than the non PE teachers designated as coaches and the voluntary coaches. No diff ($p>.05$) was found between M and F Ss in this study.

129. MAIDMENT, J.S. The effects of ankle prophylactic devices on agility. MS in Health Science, 1990, 65 p. (C. Redmond)

The purpose of this study was to determine the effects of 3 types of ankle prophylactic devices on agility scores. Ss for this investigation were 13 M HS football players aged 14 to 18 yrs. Each S wore one of the 3 braces randomly during each of the 4 consecutive testing days. Ss were tested under the following conditions: no support, athletic tape, Air Stirrup from Aircast, and Lace on Brace from McDavid. A one-way repeated meas ANOVA was used to anal the data. Newman-Keuls multiple comparisons were also used to compare the M of the 4 testing conditions. No diff ($p\geq.05$) were found between the 3 ankle prophylactic devices with respect to scores in the Right Boomerang Run Agility Test. However, the Ss ran sig ($p\leq.05$) faster without support added to the ankle. These results suggest that the application of ankle prophylactic used to prevent injuries may impair an athlete's ability to change direction quickly.

130. MAZZOCCA, A.D. The effect of a circuit weight training program followed by a detraining period on saliva cortisol and testosterone in males. MS in Movement Science, 1989, 145 p. (W. Considine)

Ss were 18 M fire fighter cadets. All Ss participated in the circuit wt training prog 3 times a wk for 9 wks. Following the 9 wk training prog, the Ss were randomly divided into a trained-detrained gp that did not participate in any strength training for 4 wks and a trained-maintenance gp that continued to train for another 4 wks. Upper and lower body strength tests (bench press and leg press) and upper and lower body endurance tests (multiple repetition bench press and leg press) were admin prior to any training, at 9 wks (posttreatment), and at 13 wks (postintervention). ANOVA with repeated meas on one factor (times of meas), Newman-Keuls multiple comparison tests, and a simple effects test were used to anal the data. No diff (p>.05) were found between the 2 gps in upper and lower body strength and endurance, saliva cortisol and testosterone levels, and testosterone-cortisol ratios. However, at 13 wks the trained-maintenance gp had a greater (p<.05) upper body endurance value than that of the trained-detrained gp. There were diff (p<.05) among M values for times of meas: Pretest upper and lower body strength and endurance values were lower than the 9 wk and 13 wk values. The 9 wk saliva cortisol level was greater than the 11 wk and 13 wk levels and the pretest level was greater than the 11 wk level; the 9 wk and 13 wk levels of saliva testosterone were greater than the pretest and 11 wk levels; and the 11 wk testosterone-cortisol ratio was greater than the 9 wk ratio.

131. MOWREY, R.J. Incentive motivation differences in United States masters swimmers. DPE, 1989, 156 p. (B. Mann)

Ss for this study were 480 USMS members (240 F and 240 M), between the ages of 23 and 94 who returned completed surveys. Surveys consisting of the Alberta Incentive Motivation Inventory, the Health and Fitness subscale of the Kenyon Attitude Toward Physical Ability subscale, and the Perceived Physical Ability subscale of the Physical Self-Efficacy Instrument were mailed to 800 registered members of US Master Swimming (USMS). To test the 3 multivariate hypotheses a 2 x 4 factorial MANCOVA was used to compare vectors of M from 8 DVs associated with physical activity motivation. Adjustment was made for 3 covariates: age, level of perceived physical ability, and yrs of exp. The independent variables were gender (F and M), and level of competition (none, local, state, national/international). The 8 DVs were affiliation, aggression, excellence, independence, power, stress, success, and health and fitness. Following adjustment for the influence of the 3 covariates, sig (p<.05) gender diff were identified for 6 of the 8 DVs. F scores were sig (p<.05) higher than M scores on the affiliation scale, while M scores were sig (p<.05) higher than F scores on the power, stress, independence, success, and aggression scales. No statistical diff (p>.05) were identified for the main effect of the level of competition variable or for the interaction effect between gender and level of competition.

132. MOYSIS, A. The relationship between attitudes toward physical activity and degree of participation for adult women. MS in Physical Education, 1989.

The Kenyon Attitude Toward Physical Activity (ATPA) Scale (1968), consisting of 6 subscales (social experience, health and fitness, vertigo, catharsis, aesthetic, and ascetic), was used to determine the relationship between the attitude toward physical activity and the degree of participation in various physical activities of adult F participants, ages 19-60 yrs, of a private insurance agency. Furthermore, the relationship between the age of the Ss and their attitude toward physical activity was examined. From 150 questionnaires distributed to Ss, 73 were answered. The Ss, in addition to their attitude towards physical activity, were questioned through a separate questionnaire designed by the researcher about their present involvement in physical activity. How often a S participated in physical activity per yr was calculated by multiplying the no. of times per mo the S participated in an activity times the no. of mos per yr. The total attitude scale score, derived by adding together the score from each statement of each Kenyon subscale, as well as the total score of each subscale, were correlated with the total physical activity score and the age of the S. The Spearman Rank Order Rho r and the z-ratio were utilized for the anal of the data. Results obtained showed a sig relationship ($p<.05$) between the total activity score and the total attitude score. There was also a sig relationship ($p<.05$) between the total score and the catharsis factor, while nonsig relationships ($p>.05$) were derived by the r between the total physical activity score and each of the social, health and fitness, vertigo, aesthetic, and ascetic subdomains. There was a neg sig ($p<.05$) relationship between the age of the Ss and the vertigo subscale while no sig relationship ($p<.05$) was indicated when the age of the Ss was correlated with the other subdomains and with the total attitude scale score.

133. MULLOOLY, C.A. The effects of exercise intensity on cholesterol levels in elderly subjects. MS in Health Science, 1988, 90 p. (S. Siconolfi)

Ss were 23 M and F volunteers, age 62-80 yrs ($\underline{M}$=71.6), who participated in either a low intensity (50% of PWC_{MAX}) or high intensity (80% PWC_{MAX}) 24 wk exercise prog utilizing bicycle ergometers. Total cholesterol levels were determined prior to the exercise prog (Test 1), at equal work for the 2 gps (Test 2), and following the 24 wk prog (Test 3). Total cholesterol values were initially 199.9 and 238 mg% for the low intensity ($\underline{n}$=9) and high intensity ($\underline{n}$=14) exercise gps, respectively. They rose to 228.1 and 265 mg%, respectively, at Test 2 and were 217 and 233 mg%, respectively, after the 24 wk prog. ANCOVA revealed no sig ($\underline{p}$>.05) diff in adjusted total cholesterol values between the 2 gps at Test 2 and Test 3. Repeated meas $\underline{t}$ tests revealed sig ($\underline{p}$<.05) higher total cholesterol values for both gps at Test 2, yet only the low intensity exercise gp had a value sig ($p<.05$) higher at Test 3 (after 24 wks) than the Test 1 value.

134. NORRIS, E. The influence of menstrual cycle phase on exercise performance of women with symptoms of premenstrual syndrome. MS in Movement Science, 1990, 98 p. (P. Hutchinson)

Max and submax exercise performance of 15 F, aged 18-30, who exp mild, moderate, strong, or severe symptoms of premenstrual syndrome was studied during the follicular and luteal phases of the menstrual cycle. The Ss completed a max exercise test on a cycle ergometer, followed by two submax exercise tests at 40 and 70 % of VO_2max during both the follicular and luteal phases. A 2 x 3 ANOVA with repeated meas on both factors (cycle phase and exercise intensity) was used to anal the data. No diff ($p>.05$) was found between the 2 menstrual cycle phases for VO_2, HR, RPE, and ventilation. The interaction between cycle phase and exercise intensity was also not sig ($p>.05$) for these variables. Anaerobic threshold, assessed by respiratory parameters, and time to fatigue during the max exercise test were found to be not sig diff ($p>.05$) between the follicular and luteal phases. Thus, on the basis of this study, any variability in the meas variables of exercise performance cannot be attributed to the phases of the menstrual cycle of the S gp studied.

135. PALMER, M.L. Selected physiological effects of a low impact aerobic dance exercise program on the elderly. MS in Health Science, 1989, 102 p. (P. Hutchinson)

Ss for this study were 19 F senior citizens who volunteered to participate in a 16-wk low impact aerobic dance exercise prog. The exercise sessions were held 2 times per wk during the summer. All of the Ss performed an initial, a mid-prog, and a post-prog Siconolfi Step Test, and resting HR and BP were recorded. Any sig changes, from a preliminary meas to after 8 and 16 wks, in resting BP, resting HR, and estimated VO2max were determined through a 1 x 3 repeated meas ANOVA. No sig ($p>.05$) changes were found among the DVs. Despite the fact the findings were not statistically sig, the results of this investigation are important for determining the necessary quantity and quality of exercise needed to improve the CV fitness and PWC among senior citizens.

136. PIVIROTTO, J. The effect of handrail support on treadmill exercise in healthy females. MS in Movement Science, 1989, 84 p. (S. von Duvillard)

Ss for this study were 45 F students attending Springfield Coll during the 1988-89 acd yr. All of the Ss were volunteers between the ages of 18 and 25 and were considered to be of ave health and fitness levels. Two testing sessions were admin to the Ss. During the first session, the Ss performed the Bruce protocol while using handrail support; during the second session, the Ss performed the Bruce protocol without handrail support. Each of the Ss performed the 2 testing protocols with approx one wk between test dates. The order of testing was randomized by [illegible] of a coin. All Ss were given a detailed explanation and demonstration of the procedures prior to testing and signed an informed consent. HR, O_2, CO_2, and a 30 sec volume meas were recorded during the final min of each stage. RPE was also recorded and was used to determine each Ss voluntary endpoint. Six dependant t-tests were calculated between handrail and nonhandrail exercise with respect to the VO_2 response during each stage and at max effort. A seventh dependent t-ratio was calculated on overall treadmill time between the 2 gps. Sig diff ($p<.05$) were found between VO_2 responses at submax workloads when comparing handrail and nonhandrail supported exercise. No diff ($p>.05$) were found between VO_2max responses elicited during the 2 testing protocols. Sig diff ($p<.05$) were established between the max treadmill time achieved when comparing handrail and nonhandrail supported exercise. A regression equation was derived from the collected data which utilized treadmill time and treadmill time squared to accurately predict VO_2max.

137. SHERMAN, J.R. The effect of ipsilateral muscular endurance training on endurance retention in the detrained contralateral limb. MS in Movement Science, 1989, 54 p. (J. Scheuchenzuber)

Ss in this study were 14 volunteer M employees from the Psychiatric Institute and the Southwest YMCA of Fort Worth, TX. All Ss participated in a 6 wk elbow flexion endurance training phase in which 3.9 kg of wt was lifted repeatedly to the beat of a metronome set at 80 bpm. The Ss lifted the wt with their nonpreferred arms until they were unable to keep pace with the metronome. Scores were recorded in sec. Ss lifted 3 days per wk with a day of rest between workouts. Following the training phase, Ss were matched by percentage increase in endurance time and randomly divided into exp and control gps. A 6 wk detraining phase followed in which the control gp refrained from exercise while the exp gp trained the preferred arm according to the same training protocol as used with the nonpreferred arm. Pretraining, posttraining, and detraining scores of the nonpreferred arm for both gps were anal using a 2 x 3

ANOVA with repeated meas on the last factor (training phase) to determine the effect of training the preferred arm on endurance retention in the detrained, nonpreferred arm. Results showed no sig diff ($p > .05$) between the exp gp and the control gp following a 6 wk detraining phase with respect to elbow flexion endurance scores of the detrained limb.

138. SOWA, E.L. The effects of biofeedback on running economy in college aged women. MS in Physical Education, 1989, 81 p. (S. von Duvillard)

Ss were 15 volunteer F from Springfield Coll. They were required to run on a treadmill and demonstrate an ability of lowering their HR by 7 bpm after reaching steady state HR. Ss utilized self-imposed mental manipulation to decrease their HR. Upon successful completion of this pilot test, Ss were required to perform the YMCA's predicted $VO2_{max}$ test on the bike ergometer to determine 75% of their predicted max HR. The final 2 treadmill tests utilized 2 diff conditions during data collection: a biofeedback condition, in which Ss were instructed to try to lower their HR while looking at a visual digital HR monitor, and a nonbiofeedback condition, during which the Ss were instructed only to run and not to try to lower their HR. HR was recorded during the last 10 sec of each stage, and BP was recorded during the last 30 sec of each stage. 2 separate 2 x 5 Repeated Meas ANOVA's were used to compare stage M for HR and SBP during the biofeedback and nonbiofeedback conditions. There was a sig ($p < .05$) interaction between the biofeedback condition and stages with regard to SBP. Biofeedback did not produce a reduction in M SBP, but may have produced a retarding effect in the increase which usually occurs with exercise. There was a sig ($p < .05$) diff for SBP with regard to stages. No sig ($p > .05$) interaction was found between condition and stage with regard to HR. A Newman-Keuls post hoc test of main effects was calculated, and the M for stages 4 and 5 in both the biofeedback and nonbiofeedback conditions were sig ($p < .05$) greater than the M in the other stages, but were not sig ($p \geq .05$) diff from each other.

139. TUOMEY, M.M. The energy expenditure of three aerobic exercise videotapes. MS in Movement Science, 1990, 128 p. (S. Siconolfi)

10 F were used as Ss to investigate the energy expenditure of 3 aerobic exercise videotapes. The exercise prog were divided into the following sections: warmup; aerobics; aerobic cooldown; and muscle tone/stretch. VO_2, meas in $ml.kg^{-1}.min^{-1}$, calories meas in $kcal.min^{-1}$, and HR meas in bpm were taken during each of the sections, and then combined for a total prog value. The exercise videotapes used were: Joanie Greggains—Vital, Vigorous & Visual (Greggains, Laurence, Kasen, & Miller, 1983)

(Joanie 1); Jane Fonda's New Workout (Advanced) (Karl, RCA Video Productions & Galanty, 1985); and Jazzercise—The Best Yet! Live! (Missett & JM Television, 1985). An edited version of Joanie Greggains—Vital, Vigorous & Visual (Greggains et al., 1983) (Joanie 2) was created by the investigator, and was also monitored. This was necessary in order to eliminate format as a factor in the results. Jane Fonda's, Jazzercise's, and Joanie 2's formats were: warmup; aerobics; aerobic cooldown; and muscle tone/stretch. Joanie 1's format was: warmup; muscle tone/stretch; aerobics; and aerobic cooldown. Each S was also tested on a treadmill for VO_2max and were shown to be of similar levels of fitness. 2-way factorial ANOVAs were computed for VO_2, calories, and HR between Joanie 1 and Joanie 2. There were no sig ($p>.05$) diff found between the 2 tapes. Joanie 1 was used in the remaining part of the investigation. Joanie 1 was found to be sig ($p<.05$) higher than Jane Fonda and Jazzercise, in total energy expenditure, with respect to VO_2. However, there were no sig ($p>.05$) diff found between the tapes with respect to calories and HR. There were sig ($p<.05$) diff in the individual segments between the 3 tapes. There were sig ($p<.05$) diff in work periods for VO_2 values, but no sig ($p>.05$) diff for caloric and HR values.

140. UNNITHAN, V. A comparison of the running economy between adults and children at four submaximal treadmill speeds. MS in Movement Science, 1989, 191 p. (J. Scheuchenzuber)

The purpose of this study was to compare the running economy between men and boys at 4 submax treadmill speeds. Running economy was assessed with respect to VO_2, stride length (SL), stride frequency (SF), HR, ventilatory equivalent for oxygen (Ve/VO_2), ventilation per kg bw (Ve/kg), respiratory exchange ratio (R), and additionally, RPE. The Ss of this investigation were 10 coll age M from the Univ of Liverpool and 10 pre-pubescent boys from Breckfield Junior School, Liverpool. Both sets of Ss performed a continuous running treadmill protocol. This protocol utilized 4 submax steady state stages of 3 min in duration at 0% grade, with subsequent increments in grade at 2.5% to voluntary max exhaustion. Each criterion variable was treated by a 2 x 4 ANOVA with one independent gps factor and one repeated meas factor, in order to compare the responses across all 4 speeds and between the 2 age gps. Sig ($p<0.05$) interactions were obtained for: VO_2 (absolute), Ve/VO_2, R, & RPE. Sig ($p<0.05$) main effects for age were obtained for VO_2, SL, SF, HR, & Ve/kg. For the main effect, speed, sig ($p<0.05$) F ratios were obtained for: VO_2, SL, SF, HR, Ve/VO_2, & RPE. It was concluded primarily from the VO2 data that boys exhibited an inferior running economy compared to men at any given submax running speed. This diff could also be attributed to biochemical, biomechanical, and ventilatory factors. Additionally, it was noted that RPE was similar in both men and boys.

141. VETRO, V. The effect of aerobic dance exercise and nutritional intervention on cholesterol levels. MS in Health Science, 1990, 153 p. (P. Hutchinson)

Ss for this study were 27 F employees of an insurance company. They were randomly assigned to 1 of 4 gps: aerobic dance alone (AD), nutrition intervention alone (NU), aerobic dance and nutrition intervention(ADN), or control (C). The AD gp participated in a 10 wk aerobic dance class for 30 min, 3 times per wk. The NU gp participated in a 10 wk nutrition prog which met once per wk and followed the AHA guidelines. The ADN gp participated in both the aerobic dance and nutrition prog. The C gp was not involved in any exercise or nutrition prog. All Ss were pre- and posttested for changes in blood lipid variables (total cholesterol, HDL-C, LDL-C, triglycerides), CV meas, and dietary intake patterns. An ANCOVA was used to anal the data. No diff (p>.05) were found among the 4 gps in any of the 18 variables under investigation. Multiple t-tests were performed to anal changes from pre- to posttest for any one gp. BW for the NU gp and % bf for the AD gp decreased sig (p<.05) from pre- to posttest. All other variables did not change sig.

142. WENNERBERG, D. The effect of adhesive ankle strapping upon isokinetic strength as measured by the use of the Biodex dynamometer. MS in Health Science, 1989, 92 p. (C. Redmond)

Recently, adhesive ankle strapping has been scrutinized as to appropriateness because of such factors as loss of supporting ability, injury issues, and the effect upon motor function. The purpose of this study was to investigate the effect of strapping upon a certain motor function, dorsiflexion and plantarflexion strength, as meas by the Biodex B-2000 isokinetic dynamometer. Strapping and no strapping conditions, with an inversion technique, were tested at 2 isokinetic speeds (30 and 120 degrees/sec) using 15 intercoll athletes as Ss. Testing protocol utilized each S performing three max contractions, full dorsiflexion to full plantarflexion, at 30 degrees/sec and five at 120 degrees/sec for both strapping conditions. M torque readings (ft-lbs) were derived for each condition and a repeated meas t-ratio was determined between the strapping conditions to indicate sig. Also, a test-retest reliability study was conducted as an adjunct using 30 Ss in the unstrapped condition to test for machine consistency. In every condition tested between strapped and unstrapped ankles no sig (p>.05) M diff were found. Test-retest reliability coefficients for the Biodex ankle apparatus for plantarflexion/dorsiflexion at speeds of 30 and 120 degrees/sec were found to be consistently low, ranging from r=.67 to .79. The low reliability results obtained would appear to mandate initial attention over the research design results. Further research is needed concerning isokinetic ankle apparatus reliability with respect to the machine itself or testing protocol. The research design results, if able to be utilized in lieu of the reliability results, indicate that ankle strapping is not an inhibiting factor of ankle plantarflexion and dorsiflexion function. This is consistent with previous research by Abdenour, White, Saville, and Abdenour (1979) and Fischer (1982). Further research could possibly concentrate upon other types of prophylactic ankle support and the effect upon motor function.

ST. CLOUD STATE UNIVERSITY **(J. KELLY)**
ST. CLOUD, MINNESOTA

143. BOWES, M.L. The development of weight-adjusted estimates of caloric expenditures for the Nordic Track. MSc in Physical Education, 1989 (J.M. Kelly)

The purpose of this study was to assess and quantify the metabolic cost of Nordic Track exercise. The direct determination of VO_2 was used to estimate caloric cost of 20 trained M skiers (age 26.8± 6.8 yr and mass 75.6±12.7 kg) while exercising on a model 600 Nordic Track ski ergometer. The physiological parameters meas included: HR, R, RR, VO_2, VCO_2, and VE. Meas were recorded at several power outputs (combinations of varying speeds and resistances). The Ss were tested on 2 separate days with each session consisting of 15 randomized stages. The 30 stages were divided equally between arm exercise, leg exercise, and the combined action of "skiing." The stages were 3 min in duration or until a steady state VO_2 was achieved. Pacing was set using a metronome adjusted to the S's stride length to keep the speedometer reading constant. The Nordic Track was calibrated before, periodically during, and after the testing to ensure consistency. Multiple regression anal was used to estimate caloric expenditures of Nordic Track exercise. S mass, arm pull rate, speedometer reading, and arm and leg resistances were the independent variables used to predict caloric expenditure for the 3 diff exercises. Arm resistance was a constant 25% of the total resistance (arm + leg) during the combined exercise. The ave respiratory exchange ratio (R) across all Ss and power outputs was 0.88. Therefore, a conversion of 4.9 $Kcals.liter^{-1}$ was used in the dev of the caloric expenditure charts. A linear regression equation for the combined activity [Kcals=0.09.mass (kg) + 0.73.speedometer reading ($km.hr^{-1}$) + 0.25.leg resistance (lbs) - 4.8] was used to construct caloric expenditure charts. The multiple r between the dependent and independent variables was 0.85 and the standard error was 1.37 kilocalories. The initial test and retest caloric expenditures were correlated to demonstrate the reliability of testing. The results demonstrated that bw had a sizeable effect on the caloric expenditure of Nordic Track skiing; +0.09 $Kcal.l\ kg^{-1}$ increase in body mass. The equation was cross-validated with an independent sample and estimated caloric expenditures were found to accurately estimate the actual expenditures, within one standard error of the regression line.

144. HARTMAN, J.E. Comparison of weight trained and nonweight trained men at eighty percent of one repetition maximum. MSc in Physical Education, 1989 (J.M. Kelly)

The purpose of this investigation was to study the effect of recent training on the number of rep that could be performed at 80 % of one rep max (1RM), and to investigate the variability of rep between gps. 2 gps of 25 M Ss performed 80% of their 1RM to fatigue on 3 strength training exercises. One of these gps had been wt training as a part of their conditioning for at least 4 mos. None of the Ss in the other gp had trained with weights during the preceding 4 mos. The exercises were the bench press, leg press, and the barbell curl. The nonlifter gp performed sig ($p<.05$) more rep on the bench press. There was no sig diff between the gps on either the leg press or the barbell curl. Hartley's F-max test was used to compare gp variabilities for each lift. There was a sig diff at the .05 level on the bench press, but both gps had similar variabilities during the leg press and the barbell curl. The results would indicate that recent weight-training had no effect on the number of rep that could be performed at 80% of 1RM on either the leg press or the barbell curl. Recent training seemed to have made a diff on the bench press exercise in the mean and variability; however, the diff may have occurred because of a lack of appropriate training to learn the skill on this exercise. The data also suggest that prescribing weight training by percentages may be inefficient, and that recent training will not alter training performance relative to the 1RM.

145. HIGGINS, P.J. The effect of varying arm to leg work ratios on VO_2 max. MSc in Physical Education, 1989 (J.M. Kelly)

This investigation was undertaken to research the effects of varying the amt of work the arms contribute to the total work load and its effect on VO_2 max. 10 upper body trained M (5 cross-country skiers and 5 football players) were used as Ss. Peak VO_2 was meas during 6 progressive VO_2max tests performed on the Nordic Track 6000 cross country skiing machine. 5 other metabolic parameters (HR, VE, VCO_2, R, and power) were also meas to help support the PML VO_2 measurements. The arms were required to perform 15%, 20%, 25%, 30%, 35%, and 40% of the total exercise load. The VO_2max tests consisted of min stages; at the end of each stage, a 50 watt increase was added to the existing workload. Resistance was increased until the S could not maintain the prescribed pace (120 strokes per min) or was stopped due to extreme fatigue. The individuals were instructed to maintain their daily living habits and training schedules. The results showed a common trend of a steady increase in all parameters up to the 35% arm load and a decrease at the 40% arm load. Sig diff were noticed at the extreme work load of 15% when compared to the work load at 35%. The highest values were most commonly attained during 30% and 35% stages. A repeated meas ANOVA was used to anal all DVs. As a result of the study, the following conclusion can be stated: (a) the relative conditioning of the upper body plays an important role in determining the optimal ratio of arm to leg work and (b) when the arms or legs are required to perform too much of the work load, a decrement in VO_2max was observed.

146. SELJEVOLD, P.J. Prediction of running performance from selected variables measured during bicycle ergometry. MSc in Physical Education, 1989 (J.M. Kelly)

The purpose of this investigation was to determine the ability of selected variables meas during bicycle ergometry to predict 12-min run performance. The variables meas during bicycle ergometry included VO_2 max, power output at OBLA, and a single stage lactate meas. 29 M volunteers served as test Ss. Descriptive physical characteristics were recorded for each S and data were collected during a max and submax bicycle test and a 12 min run. The reliability of the testing procedures and lactate analyzer was also examined. 8 Ss repeated the max and submax bicycle tests and r=.98 and .77 were found when comparing trials of the tests respectively. The lactate analyzer was also found to be reliable. 81 blood samples were collected and r=.99 was found between duplicate aliquots. VO_2 max was found to have the highest relationship with running performance (r=.75). Since bw must be transported during running and not during stationary cycling, the relationships between the power output at OBLA and running performance were expressed 3 ways: a) with no correction for bw (r=.24), b) using wt adjusted power outputs based on / kgm kg^{-1} and 13 kgm kg of bw (r=.48) and, c) using bw and absolute power output in a multiple regression anal (R=.60). The relationship between a single stage lactate meas and running performance was expressed 2 ways, a) using the lactate meas and bw in a multiple regression anal (R=.58) and b) using the lactate meas alone (r=-.42). The results of this investigation suggest that variables meas during bicycle ergometry can predict running performance, but the degree of accuracy is questionable. The mode of testing to predict performance in a selected activity should be specific to the activity.

STATE UNIVERSITY OF NEW YORK, BROCKPORT (J.P.WINNICK)
BROCKPORT, NEW YORK

147. ANSBACH, L.A. The effects of mental imagery on free throw shooting. MS in Education, 1989, 86 p. (D. Smith)

The purpose of this study was to investigate the effects of mental imagery on free throw performance. The investigator used a pretest-posttest randomized gp design consisting of 3 treatment gps and a control gp. A total of 120 Ss were randomly assigned to 4 gps. Ss received either (1) mental practice, (2) physical practice, (3) a combination of mental and physical practice, or (4) no practice. The study was conducted over a period of 5 contact sessions lasting approx 20 min each. Utilizing the anal of multiple comparisons for ANCOVA, results demonstrated that the mental imagery group did improve their free throw shooting, although it was not statistically sig. However, the combination of physical and mental practice proved to be statistically sig when compared to the control gp.

148. FISHER, J.M. A conceptual framework for physical education based upon Zen teachings and practices of mind and body unity. MS in Education, 1990, 169 p. (W.P. Fraleigh)

A conceptual framework for PE based on Zen teachings and practices of mind and body unity is composed of 5 aspects. First, as theory the beliefs and assumptions of mind and body unity as taught and practiced in the Zen tradition are clarified and adapted as the philosophical foundation of the conceptual framework. Personal development is identified as the value orientation. Second, the concept of right mindedness and Ki (Chi) is identified as the fundamental principle underlying the achievement of mind and body unity. Third, the 5 concepts of the "Go-i" of Zen training are identified as the 5 concepts to be used as the conceptual framework. Fourth, the "Go-i" of Zen training is adopted as the basis for structuring, selecting, and sequencing activities in the local PE curr. The fifth aspect clarifies the relationship between teaching, learning, and training in the process of personal dev.

149. JONES, B.C. A comparison of the effects of weight training on strength and girth measures of prepubescent and postpubescent boys. MS in Education, 1989, 53 p. (J.P. Winnick)

This study was designed to investigate the effects of a wt training prog on strength and girth meas of prepubescent and postpubescent boys. 49 Ss participated in this study.

34 Ss were trained and 15 were untrained. The trained gp consisted of 16 prepubescent Ss and 18 postpubescent Ss. The untrained gp consisted of 7 prepubescent and 8 postpubescent Ss. All Ss were given a pretest which consisted of 2 girth meas and 5 strength meas. The trained gp participated in an 8 wk wt training prog. The untrained gp participated in regular PE classes. At the conclusion of the 8 wks, both gps were posttested using the same procedures as the pretest. Data were anal using multivariate and univariate anal. The trained gp sig outperformed the untrained gp and both prepubescent and postpubescent boys improved their performance. It was also found that although overall performance generally favored postpubescent boys, pubescent status was not a sig factor on the dev of strength and girth meas employed in this study.

STATE UNIVERSITY OF NEW YORK, CORTLAND (T. STEELE)
CORTLAND, NEW YORK

150. BONNEVIE, R. A description of American alpine ski racers. MA in Physical Education, 1990.

3 diff ability gps of alpine ski racers (17 to 19 yrs old) were surveyed via a mailed questionnaire regarding their skiing and racing history and the impact of coaches. Results from the 52 responses indicated that these athletes come from affluent families, and that their families play an active role in the initiation and support of ski racing. Very elite skiers spent much more time on snow and began skiing and racing earlier than elite or successful skiers. Very elite skiers also gave coaches a higher rating and judged coaches to be more exp than did the other 2 gps. It was also found that coaches personally play an important role in the careers of alpine skiers. Findings also showed that in order to reach a very elite level of ability, the athletes must begin skiing and racing at a very young age, exp a fair degree of success at ski racing in the younger age classes. Implications were also made for young developing skiers, and a description of above ave American alpine skiers was established.

TEXAS WOMAN'S UNIVERSITY (A. UHLIR)
DENTON, TEXAS

151. ARMS, D. Attitudes toward physical activity and body image between exercising and nonexercising spouses. MA in Physical Education, 1989, 148 p. (B. Gench)

The investigator collected data to determine the attitudes toward physical activity and body image between exercising and nonexercising spouses. 154 Ss completed

Kenyon's (1968b) Attitude Toward Physical Activity and Body Image inventories. A 2-way MANOVA revealed a sig diff between exercisers and nonexercisers in their attitude toward health and fitness, and ascetics. A sig gender diff was identified with M placing more value on vertigo. F placed more value on physical activity as a means for aesthetics. A sig diff was revealed between the genders on body image. M had a more pos body image than F. A sig gender by gp interaction was caused by diff in the F gps with exercising F having a more pos body image than nonexercising F.

152. BARRIE, S. Comparison of maximal oxygen uptake: Treadmill vs. steptreadmill. MA in Physical Education, 1989, 69 p. (V. Ben-Ezra)

This study investigated the diff between the treadmill and steptreadmill for the determination of VO_2max for 18- to 35-yr-old M and F ($\underline{N}$=24). All Ss performed a graded exercise test on the treadmill and steptreadmill until volitional exhaustion. Expired respiratory gases were collected by open-circuit spirometry during the final min of exercise. The statistical results revealed a sig ($\underline{p}$<.001) diff between modalities and a sig ($\underline{p}$<.001) diff between genders. Ss exercising on the treadmill produced a 5.7% higher VO_2max than on the steptreadmill. M Ss demonstrated a 37.5% higher absolute (L/min) and a 17.7% higher relative (ml/kg/min) VO_2max than the F. These data are consistent with other studies investigating the diff between VO_2max for diff exercise modalities.

153. BEAN, S.K. A Labanotation score of David Preston's *Les Preludes*. MA in Dance, 1990, 381 p. (P. Hanstein)

The purpose of the study was to record *Les Preludes* choreographed by David Preston to music by Franz Liszt in Labanotation following all guidelines for score certification established by the Dance Notation Bureau. The Labanotation score was constructed from two existing videotapes—a 1961 version and a 1964 version. These films were viewed to obtain a sense of the quality of the whole work and to obtain the technical and artistic aspects of the choreography.

154. BURTON, S.S. Malichi, the flower fawn: The symbolism of the Yaqui deer dance. MA in Dance and Related Arts, 1990, 170 p. (P. Hanstein)

A videotape record of a Yaqui religious fiesta or pahko is the basis for an examination of the traditional cycle of dances performed by the maaso or deer dancer. This study is designed to enlarge our general knowledge of the deer dance complex, a dynamic element in Yaqui ceremonial life, by providing a more precise anal of its mvmt component than was previously available. Motif Description and Effort anal, 2 elements of Laban Mvmt Anal, provide the basis for translating the video images into a written record. The basic mvmt vocabulary and the structure and content of the various dance episodes are examined. Attention is also given to the relationship between the physical reality of the dance and its symbolic content. The overriding theme here proves to be the powerful animal mimicry which enables the dancer to become the deer for the space of his ritual performance.

155. CHORN, L.L. Health definition and health behavior: A gender-based correlational study. MA in Community Health Education, 1990, 53 p. (J. Baker)

Personal definition of health and gender have been proposed as factors in determining participation in health-promoting behaviors. The purpose of this study was to determine if a relationship between personal health definition and health behavior exists and if gender has any effect on either health definition or health promoting behavior. Adult employees of a suburban Southwestern school district were surveyed to determine their personal health definition and their participation in health promoting behaviors. No relationship between health definition and health behavior was found among women, while a weak r was found among men. Men and women demonstrated no diff in health definition. Overall, there was no diff in total level of participation in health-promoting behavior, although women demonstrated higher levels of participation in behaviors labeled health responsibility and interpersonal support.

156. DENNEHY, C. Metabolic, ventilatory, and cardiovascular responses to low pedal frequencies on a cycle ergometer. Ph.D. in Physical Education, 1989, 197 p. (V. Ben-Ezra)

The purpose of this investigation was to determine whether metabolic (VO_2, VCO_2, Lac), Ventilatory (V_E, fb, TV), and CV (HR, BP_{sys}, BP_{dia}) responses to accrued O_2 deficit diff sig when work was performed at equivalent power outputs on a cycle ergometer at pedal rates (PR) of 30, 40, and 50 rpm. Two intensities of work [50% and 65% of peak power output (PPO)] were examined, but not compared. 10 untrained F performed one incremental workload exercise test to determine PPO. This value was used to calculate workloads that would elicit 50% and 65% of PPO when PR were 30, 40, or 50 rpm. Data were collected on all Ss during each submax test for 30 min and reported in three phases: Phase I = 5 min static resting period, Phase II = 10 min submax exercise period, and Phase III = 15 min static post exercise recovery period. Phase I data were treated by a one-way ANOVA for repeated meas to establish baseline data prior to each submax test. Phase III data were treated by a one-way ANOVA for repeated meas to determine the extent of recovery. Phase II data were treated by a two-way (time x PR) ANOVA for repeated meas. Prior to reaching steady-rate at 50% of PPO, VO_2 and HR were found to diff sig among PR. VO_2 was sig diff between 30 rpm and 40 rpm and between 30 rpm and 50 rpm. HR was sig diff between 40 rpm and 50 rpm. These diff were determined as a result of mean pairwise comparisons done with the Tukey post-hoc anal. No diff were found among the PR for any variable meas at 65% of PPO. As a result of these findings, it was determined that low pedal rate (i.e., 30 rpm) impacts physiological responses when the intensity of work is approx 50% of PPO.

157. GREENWOOD, C.M. Effects of cognitive learning strategies and reinforcement on the acquisition of closed motor skills in older adults. Ph.D. in Physical Education, 1990, 168 p. (R. French/H. Meeuwsen)

While much of the psychomotor literature is devoted to physical fitness programming for the aged, limited research exists regarding gross motor skill performance of older adults. In this study, the effectiveness of the Singer 5-Step Strategy on the performance of 3 related gross motor skills in older adults was examined. In addition, the relative effectiveness of the Singer 5-Step Strategy versus a content dependent learning strategy and the effects of verbal praise were examined. Designated gross motor skills were the underhand dart throw, underhand jart throw, and the underhand ball toss. 50 M and 50 F (age 65 to 75 yrs) from the Denton comm volunteered to participate as Ss. Ss were 10 F and 10 M who were randomly assigned to one of 5 exp conditions: a content dependent strategy condition, a content dependent strategy with verbal praise condition, a content independent strategy condition, a content independent strategy with verbal praise condition, and a control condition. Data were anal using a 5 x 6 (Gps x Trial Blocks) MANOVA with repeated meas on the second factor. The anal was applied to AE and direction scores. Ss in each strategy condition performed sig better than the Ss in the control condition on the underhand dart throw, $F(4,95) = 4.34$, $p=.003$, and underhand ball toss, $F(4,95) = 6.05$, $p=.001$. In addition, Ss in the strategy conditions performed sig better than the Ss in the control condition on ball direction scores, $F(4,95) = 3.56$, $p=.009$. In contrast, the effect of verbal praise was not sig in this study. These results suggest that various cognitive learning strategies facilitated the performance of closed gross motor skills in older adults. In addition, strategies readily transferred to related closed gross motor skills.

158. GUNN, S. Dance literacy: An approach to dance in education. MA in Dance and Related Arts, 1990.

In this study guidelines were developed for a theoretical curr framework for the teaching of dance which focused on the dev of dance literacy. These guidelines evolved from a synthesis of areas of inquiry which included: 1) the arts in educ, 2) discipline-based arts educ, 3) the nature of dance, and 4) Elliot Eisner's theories of the arts, cognition, and concept formation. Information acquired from these areas of inquiry allowed for the articulation of the literary skills involved in dance literacy, which ultimately laid the foundations from which to establish the curr guidelines. It was concluded that dance may be viewed as an acad discipline, providing a unique way of understanding the world. If dance is to be taken seriously by educ, then dance scholars must provide appropriate educ goals and curr content as was demonstrated in this study.

159. HOLGUIN, O. Perceived competence, motor proficiency, and motor creativity in learning disabled boys. MA in Physical Education, 1990, 186 p. (C. Sherrill)

The purpose of this study was to predict the perceived competence of learning disabled boys, ages 7 and 8 yrs, from selected motor proficiency and motor creativity variables. Ss were 58 boys (M=7.96 yrs, SD=.54) who were classified as learning disabled and had met certain other criteria, including IQ. These Ss were randomly drawn from a data pool of 86 LD boys attending several school systems in the Dallas-Denton-Ft. Worth metroplex. The forward stepwise multiple regression anal technique was the statistical treatment selected to examine predictors of perceived competence the samples of LD boys, p<.05. Selected motor proficiency and motor creativity variables accounted for approx 12% and 18% of the total variance for perceived physical competence and perceived cognitive competence, respectively. Sig predictors were (a) visual-motor control, F(6,51) = 2.98, for perceived physical competence, and (b) strength, F(6,51) = 3.85, visual-motor control, F(6,51) = 3.17, and balance, F(6,51) = 2.52, for perceived cognitive competence. It was concluded that motor proficiency and motor creativity variables predict only a small portion of the total variance of perceived competence.

160. KNAPP, P.I. Exercise anxiety of trained asthmatic and nonasthmatic middle school females. MA in Physical Education, 1990, 150 p. (C. Sherrill)

The problem was to examine anxiety toward a 20-min run in 34 trained asthmatic and

34 nonasthmatic F and investigate variables that may relate to anxiety. Ss were in grades 6, 7, and 8 at Wilson MS in Plano, TX. Data were collected by the admin of the State-Trait Anxiety Inventory (STAI; Spielberger, 1983), the Competitive State Anxiety Inventory-2 (CSAI-2; Martens, Burton, Vealey, Smith, & Bump, 1983), and a Personal Variable Survey. A 20-min run was admin along with the completion of these questionnaires. A multivariate anal revealed no sig diff in exercise anxiety of trained asthmatic and nonasthmatic MS F. However, an intercorrelation matrix revealed there are sig relationships among the variables that relate to anxiety.

161. MOEN, S.M. Lumbar bone density in adolescent female runners. Ph.D. in Physical Education, 1990, 144 p. (C.F. Sanborn)

The present study was conducted to determine if sig diff exist in lumbar bone density or serum estradiol concentration among amenorrheic adolescent runners, eumenorrheic adolescent runners, and eumenorrheic sedentary adolescent F. A secondary purpose was to determine if a relationship exists between lumbar bone density and serum estradiol concentration among the 3 gps of Ss. 30 white, adolescent F, aged 15-18 yrs, served as Ss. 20 had run between 20 and 55 miles per wk for the past 1-5 yrs. 10 of these runners were amenorrheic, having had fewer than six menstrual periods in the past yr. The other 10, as well as the 10 controls, had had 10-13 menstrual periods per yr since menarche. Data were collected at the Aerobics Center in Dallas, TX. Lumbar (L2-L4) bone density was meas using the Lunar DPX, an x-ray based dual-photon bone densitometer. Blood was drawn from an antecubital vein on the eumenorrheic Ss' 7th or 8th day of their menstrual cycle. The amenorrheic runners' blood was drawn on the day of their bone density evaluation. % bf was estimated using hydrostatic weighing and skinfolds taken at the right triceps and calf. Nutritional factors were anal from 3-day dietary records. % bf and nutritional variables were anal descriptively. MANOVA revealed no sig diff among the 3 gps of Ss in either lumbar bone density or serum estradiol concentration. Pearson Product Moment Correlation showed no sig correlation (r=-.221, p<.26) between lumbar bone density and serum estradiol concentration. It was concluded that there is no sig diff in lumbar bone density or serum estradiol concentration among amenorrheic adolescent F runners, eumenorrheic adolescent F runners, and eumenorrheic sedentary adolescent F. Further, it was concluded that there is no sig relationship between lumbar bone density and serum estradiol concentration.

162. PARKER, J.T. *Marijuana use by adolescents in a rural Texas community: A psychosocial perspective.* Ph.D. in School Health Studies, 1990, 106 p. (L.E. Kaplan)

The purpose of this study was to collect and examine baseline data concerning the extent of usage as well as the psychosocial roles of parental, peer, and school influence, religious affiliation, and religiosity on marijuana use by adolescents in a rural TX comm. This study identified marijuana use as a common adolescent health behavior. An adolescent population of 250 9th and 10th grade students, randomly selected from HE classes, was surveyed. The instrument used was the Adolescent Drug Use Inventory. A Spearman rank r was employed to determine the relationship between parental, peer, and school influence, as well as religiosity. The Phi coefficient determined relationships between marijuana usage and gender, race, with whom the adolescent lived, parental relationship, birth order, no. of people residing in home, and religious affiliation. None of the Spearman rank r was sig at the .05 level. Phi r ranged from low to moderate (.097 to .663). The variables meas by the survey instrument were not related to marijuana use as defined by lifetime frequency usage.

163. SMITH, K.A. *Motor creativity in preschool children*. MA in Kinesiology, 1990, 186 p. (C. Sherrill)

Motor creativity was assessed in 120 preschool children, ages 3 to 5 yrs, who attended daycare centers in Denton and Dallas, and had no known handicapping conditions. Data were collected by using the Torrance Test of Thinking Creatively in Action and Movement (TCAM) and the Motor Creativity Rating Scale (MCRS). The TCAM subscales provide scores for fluency, originality, imagination, and a total score. The MCRS subscales provide scores for fluency, originality, elaboration/imagination, flexibility, and a total score. To determine if diff existed between age gps, a multivariate anal was run. The findings indicated that there are sig diff between age gps on the MCRS and TCAM. To determine if diff existed between genders, 2 sample *t* tests were run. Findings indicated gender diff on MCRS but not on TCAM.

164. SEITER, M.L. *The use of preferred sensory reinforcers to improve performance of a strengthening exercise by profoundly mentally retarded, nonambulatory children*. MA in Kinesiology, 1989, 134 p. (R. French)

Most individuals who are profoundly mentally retarded (PMR) are seriously delayed in motor behavior and physical fitness. Through appropriate training prog and the systematic use of preferred reinforcers, the fitness levels of these individuals can be improved. The purpose of this study was to examine the influence of systematically chosen sensory reinforcers on the performance of an upper body strengthening exercise by 6 PMR, nonambulatory children, ages 10 to 15 yrs. A single-subject, time-series design was used to determine the diff in performance of the exercise under the baseline condition of no reinforcement; and under the 3 exp conditions of verbal praise only, preferred sensory reinforcement only, and verbal praise plus preferred sensory reinforcement. Based on visual inspection of the data and use of the split-middle technique, Ss receiving verbal praise only or verbal praise plus sensory reinforcement improved their exercise performance over time. The gp receiving sensory reinforcement only, however, declined in performance after the baseline phase and demonstrated no improvement over time. It was concluded that the implementation of verbal praise or verbal praise plus a preferred sensory reinforcer into an exercise prog for nonambulatory, PMR individuals can positively influence their exercise performance.

165. SPANHEIMER, J. Characteristics of female Texas public school administrators as related to birth order. EdD in Physical Education, 1990, 88 p. (B. Gench)

The investigator compared birth order characteristics of F TX public school admin to determine if Adler's theory of birth order is applicable. Adler's theory (1930) is that the first-born child inherits a position of power and influence within the family and acquires traits of independence, drive, and a respect for authority. The Ss for this investigation were 40 first-born and 40 other-born F public school admin in TX. Data were collected using the Trait Evaluation Index (Bruce, 1968) and a demographic questionnaire. Personality characteristics that emerged from the data were anal to determine if there was a diff between the first-born and other-born individuals in ambition, independence, motivational drive, self-confidence, and self-organization. Through use of a multivariate anal, it was determined that there were no sig diff between first-born and other-born admin in ambition, independence, motivational drive, self-confidence, or self-organization. The findings of this study do not support Adler's theory of birth order characteristics.

166. TRAINOR, C.R. A comparison of perceived levels of occupational stress in employed women. MA in Health Studies, 1990, 68 p. (J. Baker)

The purpose of the research was to determine if there was a diff between perceived levels of occupational stress between the exp gp of employed, married, F Jazzercisers, and the comparison gp of employed, married, F sedentary Ss. 3 null hypotheses were tested. The Occupational Stress Index (OSI) included 3 subscales, and a total of 78 OSIs with accompanying demographic forms were distributed to gp Ss. Of these, 8 were eliminated in order to obtain equal sample sizes of 35 Ss in each gp. The data were anal using the BMDP statistical package and included descriptive statistics. Multiple ANOVA was used to test the hypotheses, which were tested at a .05 level of sig. No diff was found in perceived levels of occupational roles stress or personal strain between employed, married women who Jazzercised and those who were sedentary. A statistically sig diff was found in personal coping resources between gps.

167. VANCE, V.J. A reconstruction of Doris Humphrey's "Partita in G Major" from a labanotated score. MA in Dance and Related Arts, 1990, 173 p. (P. Hanstein)

The purpose of the study was to faithfully reconstruct Doris Humphrey's "Partita in G Major" from a labanotated score. The dance was originally choreographed in 1942 and reconstructed for this project in 1986. Prior to the rehearsal process, a working knowledge of the Humphrey technique and philosophy was acquired through multifaced research. The score was anal for choreographic and stylistic characteristics associated with the Humphrey technique. The theme, music, and design elements of time and space in the dance are classic examples of the choreographic structure utilized by Humphrey. The mvmt patterns and phrases of the dance were anal from the perspective of the various concepts Humphrey used to develop her technique; use of breath, suspension, fall and recovery, and dynamics. A brief synopsis of the research material and illustrations exemplifying the Humphrey choreographic structure and technique have been included in the text of the thesis.

UNIVERSITY OF ALABAMA (J. SMITH)
TUSCALOOSA, ALABAMA

168. BJURO, M. A comparison of a kinesthetic instructional strategy to a traditional method in developing golf putting skills. MA in Health and Human Performance Studies, 1990

UNIVERSITY OF CALIFORNIA, BERKELEY (R. PARK)
BERKELEY, CALIFORNIA

169. MURAKAMI, J.R. Effect of training on lactate utilization by rat muscle mitochondria. MA in Physical Education, 1989 (G. Brooks)

Mitochondrial preparations as well as homogenates from whole muscle preparations of rat leg and heart can metabolize lactate-malate in an O_2 electrode system. The ratio of lactate over pyruvate oxidation rates ranged from 0.501 ± 0.203 for endurance-trained muscle homogenates to 0.702 ± 0.271 for trained heart homogenates. The endurance training produced a sig change in the ability of muscle (57% increase) and heart (56% increase) homogenates to oxidize pyruvate-malate with a trend toward increase in lactate-malate oxidation. In general, lactate was metabolized at lower rates than pyruvate in all muscle gps, regardless of type or training. Spectrophotometrically, the pooled data from control and trained animals showed that citrate synthase activity is 260% higher in heart than mixed muscle homogenates, while muscle homogenate had a 164% greater lactate dehydrogenase activity than heart homogenate. In addition, oxidation of the substrates pyruvate-malate and lactate-malate correlated quite highly with citrate synthase activity for ***individual*** animal muscle tissue homogenates (as high as R=0.936 for heart pyruvate oxidation vs. heart citrate synthase activity). Lactate dehydrogenase activity was found in both muscle (67.715 ± 19.899 μmol/g mitochondrial protein/minute) and heart mitochondrial preparations (101.235 ± 60.514). Pyruvate kinase (a cytosolic marker enzyme) activity was low (ave 14% of reported cytosolic values) in the mitochondrial preparations, showing that lactate dehydrogenase activity in the mitochondrial preparations was not due to cytosolic contamination. It can be concluded, therefore, that lactate dehydrogenase has a mitochondrial as well as a cytosolic location and that muscle homogenates and isolated muscle mitochondria can metabolize lactate-malate as a fuel source directly without the necessity of recycling it through gluconeogenesis first.

170. VIGUIE, C.A. Human exercise and oxidative injury. Ph.D. in Physical Education, 1989 (G. Brooks)

In M, we tested 3 hypotheses related to exercise and oxidant stress. These were: 1) submax exercise induces sufficient oxidative stress to alter blood and plasma antioxidant profiles; 2) repeated exercise bouts magnify the antioxidant changes; and 3) dietary antioxidant supplementation (800 I.U. vitamin E, 1000 mg vitamin C, and 10 mg beta-carotene) enhances the blood and plasma antioxidant capacity. For these purposes, 11 moderately trained M were studied during 90 min of submax (65% VO_2max) cycle ergometry on 3 consecutive days. Exercise of this intensity and duration has previously been shown to alter the blood GSH/GSSG ratio. After the third day of exercise, Ss were placed on the above listed dietary antioxidant supplementation schedule for 2 mo before being retested. In pre-treatment trial Day 1 blood GSH decreased 73.9% (0.55 ± 0.18 to 0.32 ± 0.04mM) during exercise; GSSG increased 23% (0.54 ± 0.18 to 0.70 ± 0.04 mM), and total glutathione (GSH+GSSG/2) did not change sig. Plasma vitamin C increased 14% (41.11 ± 7.6 to 48.1 ± 8.9 uM), and the % reduced ascorbate increased 8.7% (77.6 ± 9.3 to 87.3 ± 9.7%). At the end of exercise on Day 1 blood GSSG concentration was neg correlated to ascorbate ($p<0.05$), but not after the third day of exercise. Pre-treatment Day 3, during exercise GSH declined 30% (0.37 ± 0.06 to 0.28 ± 0.03 mM); GSSG increased 27% (0.45 ± 0.18 to 0.61 ± 0.02 mM), and GSH+GSSG/2 did not change. Plasma ascorbate increased 15%; % reduced ascorbate increased 11%; and total ascorbate did not sig change. These results indicate that GSH is being oxidized to metabolize H_2O_2 or to maintain reduced plasma vitamin C. The increase in ascorbate levels during exercise suggests tissue mobilization. Urinary 8-hydroxyguanosine (oh8G), a RNA damage adduct, did not sig increase with a single bout or consecutive days of exercise before antioxidant supplementation. Glucose, lactate, CPK, LDH, Hb did not sig change during, or between consecutive exercise bouts. After antioxidant supplementation plasma vitamin E, vitamin C, and beta-carotene sig increased ($p<0.05$). There was no sig diff between resting blood GSH after antioxidant supplementation. During exercise of the first re-test trial GSH decreased 20.0% (0.30 ± 0.07 to 0.25 ± 0.02mM); GSSG increased 21.8% (0.56 ± 0.13 to 0.72 ± 0.04 mM); GSH+GSSG/2 increased 11% (0.86 ± 0.13 to 0.97 ± 0.04mM). After antioxidant supplementation, the oxidation of GSH was the same as in pre-treatment, suggesting that dietary antioxidant supplementation did not alter the metabolism of glutathione. After supplementation, plasma ascorbate increased 30% (91.8 ± 19.0 to 139.8 ± 32.1uM), and % reduced increased 6.6% during exercise. Additionally, plasma vitamin E did not change during exercise. Ascorbate was again neg correlated to GSSG at the end of exercise ($p<0.1$). The r between GSSG and ascorbate suggests a relationship between the 2 molecules and their antioxidant role. During Day 3 re-test trial, GSH decreased 34.8% (0.45 ± 0.11 to 0.34 ± 0.03); GSSG increased 22.3% (0.46 ± 0.08 to 0.60 ± 0.03); and GSH+GSSG/2 did not change. The changes in GSH/GSSG were similar to pre-treatment exercise and the 1st post-treatment trial. These data indicate that consecutive days of exercise do not change GSH responses to exercise-induced oxidant stress. Urinary oh8G did not change during or between exercise bouts after supplementation. Blood glucose, lactate, CPK, LDH, and Hb did not sig change during or between exercise bouts, or with antioxidant supplementation. Antioxidant supplementation did not sig reduce the base line of urinary oh8G. We conclude the following. In young, healthy, well nourished M 1) reactive oxidant species formed during exercise are removed by plasma ascorbate and blood glutathione, and that blood glutathione acts as a sacrificial pool to maintain reduced plasma ascorbate. 2) Blood glutathione undergoes the same redox changes on consecutive days of exercise, there being no evidence of cumulative exercise effect with 24 hrs of recovery. 3) Oxidant stress during consecutive exercise days is insufficient to oxidize human RNA. 4) Dietary antioxidant supplementation alters neither the blood glutathione redox changes during single bout or repeated exercise nor does it retard the basal changes in blood glutathione status or production of urinary RNA adducts.

UNIVERSITY OF IOWA
IOWA CITY, IOWA

171. HERMAN, E. The attitudes and perceived competence of Iowa physical educators' in teaching students with disabilities.

The primary purpose of this study was to identify factors associated with physical educators' attitudes toward and perceived competence in teaching students with disabilities. The present study extended prior research in this area by sampling a large and more representative gp of physical educators and examining a more comprehensive set of disability labels (behavioral; mental; learning; observable physical; and nonobservable physical), characteristics of physical educators (age, gender, educ training, teaching exp, exposure to individuals with disabilities within and outside of the school setting), and demographic variables (community-type and school-type). 320 of 483 (66%) physical educators, randomly selected from all physical educators in the state of IA, completed a questionnaire containing investigator-designed items and a modified version of the Physical Educators' Attitude Toward Teaching the Handicapped-II (PEATH-II) scale. Results from repeated meas ANOVA, correlational and stepwise regression anal indicated that attitudes were sig related to disability label, perceived competence, educ training, teaching exp, and age. Attitudes rank-ordered by disability label from most to least favorable were: learning, nonobservable physical, observable physical, mental, and behavioral. Perceived competence was sig related to disability label, attitudes, educ training, teaching exp, and previous exposure to individuals with disabilities. Physical educators' perceived teaching competence rank-ordered by disability label from highest to lowest was: learning, nonobservable physical, observable physical, behavioral, and mental. Attitudes, perceived competence, educ training, teaching exp, and prior exposure to disabled individuals were assessed both globally and within each disability category. The strongest relationships were observed among indices related to a specific disability category. Findings indicated that educ training and teaching exp were more strongly related to perceived competence than to attitudes. The results highlight the importance of training and exp of teachers in creating a positive teaching environment for students with disabilities and demonstrate that the beliefs of physical educators are strongly influenced by the disability label of the student.

UNIVERSITY OF MARYLAND **(D. KELLY)**
COLLEGE PARK, MARYLAND

172. CLARKE, L.C. Intralimb coordination in walking: Does the lower extremity act as coupled nonlinear limit-cycle oscillators? MA in Physical Education, 1990 (J.E. Clark)

Within the dynamical systems perspective, studies on walking and precursory mvmts to walking have attempted to meas coordination and identify coordinative structures. Using this perspective, the present study proposed that intralimb coordination exploited the dynamic properties of the body, and these properties could be associated with the properties of the coupled nonlinear limit-cycle oscillator. To test for the properties of entrainment, phase-locking, and structural stability in the intralimb coordination of the shank and thigh in mature walking, 9 F Ss were filmed while walking at their preferred speed. 5 conditions were filmed to test the coordinative structure and elucidate the presence of coupled nonlinear limit-cycle oscillator properties. One normal walking condition, three ankle wt perturbation conditions of 7.5%, 12.5%, and 17.5% of the S's bw, followed by another baseline condition were filmed over 4 continuous cycles. Coordination among the shank and thigh during walking was meas by a phase angle on a phase plot. Invariance in the angle by the 4th cycle reflected the attainment of structural stability and a phase-locked state. In accordance with the dynamic systems perspective, it was hypothesized that the wts would either shift the system out of its phase-locked state only briefly, or that the wts would be sufficient to shift the system away from its normal mode and into a new phase-locked state. Evidence from this study suggests the presence of nonlinear limit-cycle oscillator properties in intralimb coordination for mature walking.

173. DARDEN, G.F. The effects of visual training on selected visual abilities and performance of a motor skill. MA in Physical Education, 1990 (E.Y. Brown)

The purpose of this study was to investigate if incorporating visual training techniques would enhance visual abilities and ultimately performance of motor skills. A visual training enhancement prog utilizing the AcuVision 1000^{tm} was evaluated for its effect on RT, peripheral vision (horizontal and vertical), and a battery of BB skills. 30 M volunteers enrolled in a beginning BB class at the Univ of MD participated in the study. Ss were randomly assigned to an exp gp (N=17) receiving visual training along with skill instruction, or a control gp (N=15) in the same class receiving identical instruction but no visual training. Exp Ss attended 15 min supervised training sessions 3 days per wk for 5 wks. Following screening, all Ss were tested on the Lafayette Reaction/ Movement Timer, Bernell Arc Perimeter, and 3 AAHPERD standardized skills tests meas BB ability (passing, shooting, dribbling). All tests were readministered at the end of 5 wks. Results were anal using a 2 x 2 factorial design ANOVA. Univariate tests revealed sig pre-post diff between gps in both horizontal peripheral meas, and in one RT meas ($p<0.05$). Post-hoc anal, utilizing the Bonferroni T was performed on the main effects to assess the sig interactions. No effects were observed between gps for any of the skills test meas. Pre-post interactions revealed sig effects for all skills tests ($p<0.05$). Nonsig diff revealed the training gp improved slightly over the control gp in all meas of visual abilities and BB skills. The results support the contention that certain visual abilities are trainable, but provides no evidence that these improvements transfer to sig improvements in motor skill performance.

174. DAWSON, P.K. Effects of training on resting blood pressure in men at risk for coronary heart disease: Strength vs aerobic exercise training. MA in Physical Education, 1990 (B.F. Hurley)

To compare the effects of strength training to those of aerobic exercise training on resting BP, 15 untrained M (50 ± 9 yrs, M ± SD) were studied before and after 16 wks of training. 5 M were assigned to either a walk/jog prog, a strength training prog, or an inactive control gp. All Ss were at risk for coronary heart disease (CHD). Resting SBP and DBP were assessed 3 times daily on 4 diff days for both supine and seated postures. Strength training consisted of 2 sets of 12 Nautilus exercises performed 3 times per wk. Aerobic exercise training consisted of treadmill walking/jogging at 75-85% of max HR reserve for 30 min 3 times per wk. 5 sedentary M completed the same testing procedures at similar time intervals and served as control Ss. Sig reductions ($p<.033$) in resting SBP and DBP resulted from aerobic exercise training. No sig changes in BP resulted in the strength training and control gps; however, some individuals in the strength training prog experienced large reductions in resting BP. These results suggest that strength training does not lower resting BP similarly to aerobic exercise training, but it does appear that either training modality may lower resting BP for some individuals. More research is needed using larger sample sizes to confirm these conclusions.

175. ERO, J.O.M. Muscle stretch amplitude and load associated with vertical jump performance, muscle elastic contractile properties, and myoelectrical activity. Ph.D. in Physical Education, 1990 (D.L. Santa Maria)

11 M Ss participated in a study to examine the influence of skeletal muscle stretch

amplitude and load on vertical jump performance, muscle's elastic/contractile properties, and myoelectrical activity. Ave integrated electromyograms (IEMG), knee joint angular displacement, vertical ground reaction force, and vertical jump ht were meas while Ss executed max voluntary static jumps (SJ), counter-movement jumps (CMJ), and drop jumps (DJ) on a Kistler force platform. Ss performed DJs from heights of 40 (DJ40) and 55 cm (DJ55). All jumps were performed with a small and large knee angle amplitude. Ave IEMG activity was recorded from the vastus lateralis, gluteus maximus, and gastrocnemius muscles of the rt leg. Knee angular displacement was recorded using a Penny-Giles electrogoniometer fixed to the lateral side of the left knee joint. Mechanical eccentric and concentric parameters (e.g., force, velocity) derived from CMJs and DJs were compared to jumps without an active stretch (SJs). Information dealing with the behavior of the muscle's elastic/contractile properties during the various jump tests was obtained by examining the ave IEMG/Force (I/F) ratios corresponding to the concentric contraction phases. For vertical jumps involving active stretch (CMJ, DJ40, and DJ55), the jump ht and ave concentric force were influenced more by stretch amplitude (knee angle) than by stretch load (drop hts). The greater the stretch amplitude, the higher the jump ht ($p<0.01$) but the smaller the resulting force ($p<0.01$). For ave concentric velocity and power, the greater the stretch load, the greater the resulting velocity and power (CMG vs DJs, $p<0.05$); the greater the stretch amplitude, the greater the velocity (DJs only, $p<0.05$) but the smaller the resulting power (CMG and DJs, $p<0.01$). Only for the gastrocnemius, the greater the stretch load, the lower the resulting I/F ratio (CMJ vs DJ55, $p<0.05$) regardless of stretch amplitude It was concluded that the gastrocnemius shows a greater utilization of elastic/contractile potentiation compared to the vastus and gluteus muscles. Regardless of stretch amplitude, load, and muscle, the ave IEMG activity corresponding to the concentric contraction was greater than that of the eccentric contraction ($p<0.05$). It was concluded that long-latency reflexes are involved in active stretch jumping in which the eccentric contraction is at least 150 ms long. This involvement was not dependent on stretch amplitude and load.

176. FRENCH, J.M. The effects of a school-based exercise program on selected fitness components of children. MA in Physical Education, 1989 (P. Vaccaro)

The purpose of this study was to investigate the effects of a 6 wk school-based exercise prog on cardiorespiratory endurance, muscular endurance, muscular strength, flexibility, and body composition. 16 boys and 16 girls, age 8 to 11, were randomly divided into 2 gps; 8 boys and 8 girls were placed in an exp gp and 8 boys and 8 girls were placed in a control gp. The exp gp participated in a specified circuit exercise prog twice weekly for 6 wks. The exercise prog consisted of a variety of 60 sec exercises which were alternated with 60 sec jogging/walking intervals. 10 reps of exercise and jogging/walking were accomplished in the allotted 20 min. Project Superfit, MD's Physical Fitness Test (MD Commission on Physical Fitness, 1987) was admin to both gps before and after the 6 wk exercise prog. A follow up test was admin 6 wks following the exercise prog to meas detraining effects. A paired t-test indicated no sig diff (p>.05) between gps on all fitness parameters. The 20 min school-based circuit exercise prog, which was admin 2 days per wk for 6 wks, did not alter cardiorespiratory endurance, muscular endurance, muscular strength, flexibility, and body composition.

177. GEMS, G.R. Sport and culture formation in Chicago, 1890-1940. Ph.D. in Physical Education, 1989 (N.L. Struna)

The study draws upon American sport history, labor history, and the cultural hegemony concept of Antonio Gramsci to examine the formation of sporting culture in Chicago between 1890 and 1940. The sporting culture of the earliest residents of Chicago followed pastoral ideals. The Indian tribes and French- Canadian trappers who inhabited the region engaged in utilitarian pastimes, such as hunting and fishing, and irregular bouts of drinking, dancing, and gambling similar to other frontier societies. That rustic lifestyle changed abruptly as eastern settlers, predominantly New Englanders, quickly subsumed the old culture in the 1830s. The sleepy village became an urban center as easterners replaced the largely subsistence economy with a commercially-oriented market one. In so doing, they also attempted to organize and regulate leisure practices. The European migrations of the antebellum yrs introduced alternative leisure practices and Old World cultural values that differed with those of the native Americans. Labor and leisure issues came to a head in the violent labor confrontations of the late 19th century. As an alternative to such hostility, progressive reformers attempted to infuse ethnics with "American" values through a wide range of competitive sports and games in both public and private agencies. Such prog confronted the already established leisure practices of the street culture and the ethnic athletic clubs. Rather than effect a passive imposition of mainstream values on subordinate gps, the process of culture formation required an active accommodation among the divergent gps. That process resulted in both adoptions and adaptations of the middle class leisure practices and values. This study maintained that a pluralistic model of culture transpired. It refutes sociological interpretations of sport as a reflection of society. The study contradicted the "melting pot" theory of assimilation, and stated that subordinate gps have had a dynamic role in the formation of culture. The study concluded that subordinate gps adapted the commercialized sport organizations and structures of the natives to fit their own ethnic or class values. Sport came to serve as a cohesive social bond in a mass culture that incorporated divergent gps, but sporting practices continued to hold different meanings for Chicagoans.

178. HALLER, C.F. Effects of occluding segments of ball flight trajectory on the catching performance of children and adults. MA in Physical Education, 1988 (J.E. Clark)

According to direct perception theory, perception is continuous. Visual information only needs to be sampled for a short time by the observer. The future location of a ball in motion, therefore, should be immediately determined by the observer. Any perturbation of the ball flight such as occluding its path at various points should not disrupt accuracy of catching performance. Forty-five 7- and 9-yr-old and adult right-handed M were videotaped engaged in a single-handed catch. A throwing device was used to toss hard-core sponge balls. A screening device was used to occlude the first, middle, or last segments of ball flight. Ss received a total of 10 trials for each condition of occlusion and 10 trials without occlusion. Performance scores were evaluated for hand position and grasp. Results indicated that adults and 9-yr olds were sig diff from 7-yr-olds during the hand positioning phase in all conditions. Baseline and occlusion of the last segment were statistically diff from occlusion conditions of the first and middle segments for the 7-yr-olds. Results of the grasp phase indicated that adults were sig diff from the 7- and 9- yr-olds in all conditions; 9-yr-olds were sig diff from the 7-yr-olds in all conditions. Occluding vision of the last segment sig affected grasp performance of the 7-yr-olds. The results of this study indicated that there is a dev trend in which one-handed catching performance improves with increasing age. Occlusion of the last segment of ball flight for the 7-yr-olds has a detrimental effect on hand position and grasping. The suggestion is that vision plays a critical role in catching and that restricting viewing on the last segment for this age gp may be important in fine tuning the act of catching.

179. HUCZEL, H.A. Comparative muscular strength and fatigability of physically inactive and strength-trained females. MA in Physical Education, 1989 (D.H. Clarke)

The purpose of this study was to compare muscular strength and fatigability of the elbow flexors of strength-trained (ST) and untrained (UT) F during a 6-min bout of max rhythmic exercise at a rate of 30 contractions per min. Force received by a load cell was converted into electrical energy and transmitted to a Beckman Type RS Dynograph. 15 ST and 15 UT Ss, ages 18-34, were tested for diff in initial strength, final strength, absolute endurance, relative endurance, and rate of fatigue. Gps were pair-matched according to body mass index (BMI). Means were compared for the 2 gps on the exp variables, and rates of fatigue were determined by exponential curve fitting procedures. Results revealed a sig diff in initial strength, final strength, and absolute endurance in favor of the F bodybuilders. No sig diff was detected for relative endurance between the gps and rates of fatigue were similar for the ST and UT gps. It is concluded that muscular strength and endurance are enhanced simultaneously in F Ss as a result of engaging in a training prog designed primarily to increase muscular strength and hypertrophy.

180. KEPPLE, T.M. Validation of a video-based six degree-of-freedom mechanical analysis procedure for application to human motion. MA in Physical Education, 1989 (D.L. Kelley)

This thesis was designed to validate a video-based procedure for anal the motion of rigid bodies for the eventual application to human motion. The procedure, named MOVE3D, eval 6 degree-of-freedom motion by monitoring the three-dimensional spatial coordinates of target markers fixed to the rigid body. A Vicon meas system consisting of four 50 Hz video cameras and a single force plate was used for data acquisition. AMASS software reduced the video data to three-dimensional coordinates. The marker coordinate data were low pass filtered at 3.0 Hz by a fourth-order Butterworth digital filter. A pendulum was used to evaluate the accuracy of the kinematic and kinetic meas for 3 test conditions, with the direction of the axis of rotation varying between conditions. Data from 5 trials, with 5 cycles per trial, were obtained for each test condition. Root-mean-square errors and error ranges were determined. Angular displacement RMS errors of less than 1° and angular velocity RMS errors of less than 5.0°/sec RMS were obtained. The acceleration and force meas were characterized by decreased accuracy due to the introduction of noise at substantially higher frequency than the signal. The validation of the net moment estimates was hindered by the small amplitude of the pendulum driving moments. This thesis demonstrated that with the exception of motions of very small amplitude, a video-based data collection system can be used to obtain 6 degree-of-freedom meas of the motion of rigid bodies.

181. MATHIS, S.C. Finger contact force-time curves measured in a simulated rock climbing situation. MA in Physical Education, 1989 (C.O. Dotson)

The primary purpose of this study was to investigate the relationship between face climb angle, foothold size, and rock climbing ability on force exerted on the handhold during a simulated rock climbing situation. 2 foothold sizes and 3 climb angles were set for this study. The following variables were meas: max voluntary finger contact force (MVFCF), max finger contact force used to step into position on the test climb (MFCF), M finger contact force used to maintain position on the test climb (FCF), and time to finger contact fatigue (FF). A secondary purpose of this study was to determine which variables correlated with rock climbing ability. 5 F and 15 M rock climbers (18-57 yrs) from the Washington, DC area volunteered for the study. The skill range of the climbers was from 5.4 to 5.12 Y.D.S. with yrs of experience from 1 to 12 yrs. Visual anal of the force-time curves generated showed that the Ss produced a peak of force as they stepped into position and then held a fairly flat curve for the duration of their time on the test climb. Data anal showed that MFCF and FCF were more dependent on foothold size than on climb angle. Climb angle did affect MFCF and FCF for climbers on large footholds but climb angle did not sig affect MFCF or FCF for climbers on small footholds. Variables that correlated highly with climbing ability were: MVFCF, yrs of rock climbing exp, MFCF on large footholds, M FCF on large footholds, and time to FF on small footholds.

182. MOYER, M.R. The effect of physical activity on coronary heart disease: A meta analysis. Ph.D. in Physical Education, 1989 (C.O. Dotson)

A meta anal was performed on 138 training studies (1960-1985) to ascertain the relationship of intensity, duration, frequency, and length of prog of an exercise regimen to change in the DVs of SBP, DBP, total cholesterol (TC), high density lipoprotein-C (HDL-C), low density lipoprotein-C (LDL-D), triglyceride (TG), bw (KG), and % bf. Changes in CHD mortality due to reduction in risk factors were assessed by the use of the standardized incidence ratio (SIR) developed by the Pooling Project. A weighted residualized change score (ES) was employed to meas change in the DVs. Regression anal of the data revealed that changes in effect size in all but one of the DVs were sig related (p=.05) to changes in the independent variables. Duration was linearly related to changes in VO_2max, TC, LDL-C, TG, and SBP, while frequency was associated with change in % bf, SBP, DBP, LDL-C, and VO_2max. Changes in SBP, DBP, and LDL-C were also functionally related to the length of a training prog. Intensity as meas by METS contributed to changes in SBP, HDL-C, and VO_2max. The only DV failing to show a relationship to change in the independent variables was bw. Projected reductions in CHD mortality associated with an exercise prog were computed from the SIR. Changes in relative risk of CHD mortality were calculated for SBP, DBP, and TC. Changes in the SIR were dependent on the initial level of the DV involved, therefore no attempt was made to subject these changes to sig tests. Projected change in relative risk corresponding to the mean changes in SBP, DBP, and TC in this study range from a reduction of approx 1% for SBP to 12.5% for DBP, with change for TC falling in between these two values. No single quantification variable of training was related to change in all risk factors evaluated in this anal. Therefore, exercise prescription should be formulated according to the individual risk factor to be modified.

183. SALITSKY, P.B. The effects of visual training on performance of a motor skill. MA in Physical Education, 1990 (E.Y. Brown)

A visual enhancement training prog utilizing the AcuVision 1000^{tm} Visual trainer was evaluated for its effect on the performance of motor skills, TRT, RT, vertical and horizontal peripheral vision. The purpose of this study was to investigate if incorporating visual training techniques while practicing motor skills will enhance performance. 19 M and F coll students (exp) enrolled in an intermediate volleyball class practiced visual training for 15 min, 3 days per wk for 5 wks, while 21 students (control) enrolled in a similar class taught by the same instructor received identical instruction but no visual training. Visual training skills included visual perimetry and hand-eye coordination employing the AcuVision 1000^{tm} Optometric Visual Trainer. All Ss (N=40) were initially screened for visual defects on a Bernell Brewster stereoscope and pre- and posttested on the Lafayette Reaction/Movement Timer, Bernell Arc Perimeter (horizontal and vertical peripheral vision), and AAHPERD's 3 basic volleyball skills tests (serve, forearm pass, overhead pass). RT, peripheral acuity, and volleyball skills tests were statistically anal employing a univariate anal within a general linear model procedure. Anal of the data revealed no sig diff for both gps. However, within Ss anal revealed sig main effects pre-post. The findings of this study fail to provide evidence for the concept of a visual enhancement training prog affecting the performance of a sport skill.

184. SCHAFFNER-LINDLE, R. The effects of locomotor skipping on aerobic capacity and injury rate in college age women: A comparison with jogging. MA in Physical Education, 1989 (B.F. Hurley)

This study compared the effects of a locomotor skipping training prog to a jogging prog of similar frequency, intensity, duration, and length of training with regard to VO_{2max}, body composition, and type, frequency, and severity of injury incurred. The jogging gp was used as a reference control. 30 untrained ($VO_{2max} \leq 40$ ml.Kg^{-1}.min^{-1}.) F volunteers between the ages of 18 and 30 yrs participated in the study. Exp Ss (n=23) were randomly assigned to either the skipping or the jogging gp. The remaining Ss (n=7) served as inactive controls. Exp Ss attended supervised training sessions 3 days per wk for 8 wks. The training intensity was 70-80% of HRmax. The duration of the training sessions was progressive and increased in length from 12 to 30 min over the 8 wk training period. Daily records were kept of any injury that the participant felt was attributable to the training prog. Injuries were recorded by type, frequency, and severity. Severeness of injury was ranked by the level of disability produced. VO_2max was meas during a continuous treadmill test before and after the training period. % bf was also meas pre and post training via hydrostatic weighing. To evaluate the effects of the training prog on cardiorespiratory responses and body composition a 2 x 3 ANOVA with repeated meas on one factor was applied to VO_2max, % bf, and lean body mass. Both the joggers and the skippers showed sig improvement ($p \leq 0.05$) on the VO_2max test (10% and 8% respectively). Although the jogging gp showed slightly greater improvement there was no sig diff between the two training gps. There was also a sig decrease ($p \leq 0.05$) for both gps in % bf (7% for both gps). Joggers sustained 50% more injuries than the skippers. Sites of sig diff included the shin and the knee. The only site that produced greater injuries in the skippers was the feet, mainly blisters. The results of this investigation indicate that for untrained coll-aged F skipping can be used as an alternative aerobic training modality, which when implemented in an 8 wk training prog following ACSM guidelines for frequency, intensity, and duration can result in sig increases in aerobic capacity, comparable to that of jogging; sig decreases in % bf, and reduction in frequency of musculoskeletal soreness and/or injury, particularly to the knee and the shin.

185. SMUTOK, M.A. Effects of strength training on glucose tolerance and insulin sensitivity: A comparison to aerobic exercise training. Ph.D. in Physical Education, 1989 (B. Hurley)

To determine whether strength training can induce favorable alterations in glucose regulation, 37 untrained M with high risk profiles for CHD (age=50 ± 10 yrs: M±SD) were studied before and after completion of 20 wks of either a circuit wt training prog (N-14), a treadmill walk/jog prog (N-13), or no exercise prog (N-10). The walk/jog gp was used as reference controls and the no exercise gp was used to control for methodological variation. Plasma concentrations of glucose and insulin were meas after a 12-14 hr fast and during a standard oral glucose tolerance test (OGTT) before and approx 19 hrs after training. MANOVA was used prior to univariate anal and planned comparisons were made to determine the effects of each training modality and whether training-induced changes between strength and aerobic exercise training differed. In contrast to aerobic exercise training, strength training had no sig effect on VO_2 max or body composition. However, strength training produced sig reductions in total plasma glucose area ($mg.dL^{-1}.120min^{-1}$) under the OGTT curve (20879±6092 vs 18806±6043, $P<0.05$) and in plasma glucose levels ($mg.dL^{-1}$) at 60 min (202±57 vs

178±64, P<0.05), 90 min (189±75 vs 164±71, P<0.05), and 120 min (170±75 vs 150±74, P<0.05) after glucose ingestion. Strength training also lowered the total plasma insulin area (μU.ml^{-1}.120min^{-1}) under the OGTT curve (8648±3428 vs 6842±1910, P<0.05) and plasma insulin levels (μU.ml^{-1}) during fasting (15±11 vs 12±7, P<0.05) and at 90 min (84±45 vs 60±20, P<0.01) and 120 min (91±47 vs 57±29, P<0.01) after glucose ingestion. There were no sig diff in OGTT results between strength and aerobic exercise training and no changes were observed in the no exercise gp. Results indicate that strength training may improve glucose tolerance and increase insulin sensitivity to the same extent as aerobic exercise training in M at risk for CHD, independently of changes in aerobic capacity or body composition. These findings suggest that strength training may reduce risk for CHD by improving glucose regulation.

186. WAGNER, D.L. The effects of academic rule changes on Region 20 JUCO men's basketball programs. MA in Physical Education, 1990 (J. Wrenn)

In 1984, 1986, and 1988, the National Junior College Athletic Association (NJCAA) imposed changes in acad eligibility requirements on students who wished to participate in intercollegiate athletics. This study examined the effects of those requirements on the comm/JC BB prog in NJCAA Region 20 during the 1988-89 season. A total of 25 comm/JC athletic prog in MD, PA, and OH were evaluated. These institutions represented 293 student-athletes. The AD and head BB coach from each institution responded to an eligibility survey questionnaire to determine the status of the student-athletes in their BB prog. The results from the questionnaire were combined to evaluate prog opportunity trends and the current eligibility status among comm/JC, states, and also scholarship versus nonscholarship prog. A no. of the institutions in Region 20 exp a decreased no. of participants in their BB prog during the 1989 Spring semester due to acad ineligible student-athletes. MD representatives and nonscholarship prog in Region 20 tended to have a higher percentage of acad ineligible student-athletes. Responses from ADs and head BB coaches from nonscholarship institutions stated this was due to current NJCAA eligibility guidelines which do not conform to the comm/JC athletic structure.

UNIVERSITY OF MASSACHUSETTS **(J. HAMILL)**
AMHERST, MASSACHUSETTS

187. HENNINGS, D.L. A comparison of male and female runners, weight lifters, and sedentary controls in the R-amp response to exercise testing. MS in Exercise Science, 1989, 71 p. (S.A. Plowman)

55 volunteers were divided into age- and gender-matched gps (endurance-trained [RUN], weight-trained [WLT], and healthy sedentary [CTL] controls) to investigate R-wave amplitude (R-amp) and hemodynamic response to exercise. Body composition was determined via hydrostatic weighing. VO_2, HR, BP, RPP, and R-amp in leads II, AVF, V_5, AVR, V_1, and V_3 were recorded during a graded exercise test to exhaustion. Two sums of R-amp were calculated: RS, the R-amp sum of the septal leads AVR, V_1, and V_3; and Rl, the sum of R-amp in the left lateral leads II, AVF, and V_5. Data were anal using appropriate ANOVA and ANCOVA comparisons. M exhibited a sig ($p<.001$) greater RPP_{max} than F. The R-amp for M and F was sig reduced when compared to rest ($p<.001$) in all leads except V_1 at max exercise and leads II and V_1 at immediate recovery. There was a sig increase in R-amp from max exercise to immediate recovery for M and F inRL and lead V_1. The R-amp in lead V_5 exhibited a sig gender diff ($p=.002$) at the 1st min of exercise, with amplitude increasing for M and decreasing for F. The R-amp in RS and lead AVR exhibited a sig interaction between training and time. The RUN gp had a markedly lower R-amp in lead AVR than the CTL gp at Min 1 of exercise and both the CTL and WLT gps at max exertion. Leads V_3 and RS showed a sig reduction in R-amp for the RUN gp, as compared to the WLT and CTL gps at max exertion and to the WLT gp only at immediate recovery. It was found that the general pattern of R-amp response during exercise was similar between training gps.

UNIVERSITY OF MIAMI (OHIO) **(H.A. LAWSON)**
OXFORD, OHIO

188. GIRARD, D.R. Athlete's perceptions of noncontingent awards. MSc in Physical Education, 1989 (T. Horn)

This study meas athletes' perceptions of noncontingent awards. Current research and theory suggest that awards which are perceived to be noncontingent, salient, controlling, or uninformational will have a negative effect upon subsequent intrinsic motivation. These aspects are theorized to affect an individual's need to feel in control of, and competent in the activities or behaviors they perform. Based on the research and theory, this study hypothesized that athletes would perceive participant awards to be salient, noncontingent, controlling, and uninformational. To test the study's hypotheses, a survey was designed to meas athletes' perceptions of these 4 aspects and was administered to 89 Division I coll hockey players. Results of the study were mixed as some athletes' perceptions about the awards agreed with the study's hypotheses, while others did not. Also, the American athletes perceived a sig greater amount of control from these awards than did their Canadian peers.

UNIVERSITY OF MINNESOTA (S.J. SCHLEIEN)
MINNEAPOLIS, MINNESOTA

189. HEYNE, L.A. School-based leisure education: Social and motor skill acquisition by learners with autism in an integrated physical education classroom setting. MA in Therapeutic Recreation, 1985, 160 p. (S.J. Schleien)

12 students with autism (ages 4-12) participated in integrated PE classes with 50 nonhandicapped peers to assess social play and motor skill acquisition under 2 conditions: a collaborative therapeutic rec-adapted PE curr (exp condition) and a traditional PE curr (control condition). Ss were divided into 2 age gps (younger and older) and randomly assigned to one of 2 curr conditions. Each gp attended 25-min sessions twice weekly for 9 wks. Pre and post-program assessments of social behaviors and motor skills were conducted. Social behaviors (appropriate play, inappropriate play, target behaviors) were assessed across 5 levels of play (Isolate, Parallel, Cooperative/Competitive-Dyad, Cooperative/Competitive-Gp, Team Play) using a time-sampling technique. Motor skills (jump, catch, strike) were assessed using a task-anal, criterion-referenced instrument. Paired t tests indicated sig improvement in: appropriate play at the Cooperative/Competitive-Gp level for the younger exp gp, and the Cooperative/Competitive-Dyad level for the older control gp; inappropriate play at the Parallel and Cooperative/Competitive-Dyad levels for the younger control gp, and at the Parallel level for the older control gp. No sig progress in motor skills was noted. Effectiveness of the collaborative curr over the traditional curr was inconclusive. Findings suggest participation in integrated PE classes can dev appropriate social play behavior by students with autism.

UNIVERSITY OF NEW MEXICO **(J.A. GUSTAFSON)**
ALBUQUERQUE, NEW MEXICO

190. SCANTLING, E.L. The relationship between attitude of secondary school principals toward physical education and program effectiveness in selected public high schools in the state of Nebraska. Ph.D. in Physical Education, 1990

The general purpose of this study was to examine the relationships between the attitudes of secondary school principals toward PE and PE prog effectiveness in selected public HS in the state of NE. Therefore the following hypotheses were investigated: 1. There will be no sig relationship between principals' attitudes toward PE and PE prog effectiveness; 2. There will be no sig relationship between gender of the principal and PE prog effectiveness; 3. There will be no sig relationship between prior PE teaching exp by the principal and PE prog effectiveness; 4. There will be no sig relationship between prior athletic coaching exp by the principal and PE prog effectiveness; 5. There will be no sig relationship between those principals with no prior PE teaching exp and/or athletic coaching exp and PE prog effectiveness; 6. There will be no sig diff between M and F principals' attitudes toward PE; 7. There will be no sig diff in attitudes toward PE between principals with prior PE teaching exp and those with no PE teaching exp; 8. There will be no sig diff in attitudes toward PE between principals with prior athletic coaching exp and those with no athletic coaching exp. 36 secondary school principals and the PE prog at their schools were used as Ss. A questionnaire was used to collect information related to the secondary school principals' attitudes toward PE. An evaluation instrument was utilized during on-site visitations to determine PE prog effectiveness at each of the schools. The data for hypotheses 1, 3, and 4 were anal using Pearson's r, Multiple regression, and Stepwise regression. Hypothesis 5 was anal employing Pearson's r and Chi Square test of independence. The data for Hypotheses 7 and 8 were anal using ANOVA techniques. The level of sig was determined by employing Bonferroni's adjustment for all tests conducted. The mean attitude score for the 36 secondary school principals was 67.11. The mean effectiveness score for the PE prog was 119.14. A majority of the principals (63.9%) indicated no prior PE teaching exp, while 77.8% of the principals had previously served as an athletic coach. This investigation found no sig results when considering the relationship between principal's attitudes and PE prog effectiveness. However, it was indicated that an inverse relationship may exist between yrs of exp as an athletic coach by the principal and the principals' attitude toward PE. This study also found no sig diff between prior PE teaching exp and/or athletic coaching exp by the principal and attitude toward PE. A sig contribution of this study was dev of a valid and reliable instrument for meas PE prog effectiveness at the secondary level.

UNIVERSITY OF NORTH CAROLINA, CHAPEL HILL (F. PLEASANTS)
CHAPEL HILL, NORTH CAROLINA

191. GUTER, R.E. Dominance versus nondominance and the incidence of injury. MA in Physical Education, 1989 (F. Pleasants)

The purpose of this study was to determine if there was a diff between the frequency of injury to preferred extremities compared to nonpreferred extremities in selected varsity intercollegiate athletes. Ss (N=141) were selected from the men's and women's track, men's wrestling, men's swimming, women's gymnastics, and men's lacrosse teams at UNC, in Chapel Hill, NC. The Briggs and Nebes Modification of Annett's (1967) handedness inventory was used to determine the degree of the S's limb preference. Individuals whose limb preference was found to be sig ($-9 > Q > +9$) were asked to serve as Ss in the study. The Ss' injury records from Sept 1987 to Apr 1989 were examined to identify those episodes that were operationally defined as appropriate injuries in the study. Injury frequencies were totaled by sport and for the entire sample. No sig diff in injury frequencies were found between the preferred and nonpreferred extremities. The results indicate that limb preference alone is insufficient to predict injury.

192. KEENAN, P.A. The effects of aspartame on moderate intensity endurance exercise. MA in Physical Education, 1988 (R.G. McMurray)

To investigate the effects of aspartame ingestion on endurance performance, 6 trained F ran at 70% VO_2 max until exhaustion, 45 min after the ingestion of an aspartame capsule (100 mg), a saccharin capsule (500 mg), and a lactose placebo capsule. A double-blind protocol was used. There were no sig diff in HR response, R values, VO_2 plasma lactate concentration, or plasma free fatty acid levels between treatments. Duration of exercise and RPEs were similar for each treatment. Aspartame treatment yielded a sig lower plasma glucose value at the 60th min of exercise, but not at 30 or 90 min of exercise. 3 Ss experienced diuretic and/or bowel problems; however, these did not prematurely end their run. It was concluded that aspartame ingestion prior to endurance exercise exerts no discernible metabolic effect. These data suggest that aspartame is a viable placebo for future research but is not an ergogenic aid candidate.

193. LANCHANTIN, M.M. The history of intercollegiate swimming at the College of William and Mary (1928-1987). MA in Physical Education, 1989 (F.O. Mueller)

This thesis explores the history and dev of competitive swimming teams for M and F at the Coll of William and Mary from 1928 through 1987. Research was collected through local and campus newspapers, sports information office files, and personal interviews with coaches, swimmers, and athletic administrators. The study is divided into 4 chapters. The early yrs of competitive swimming prior to 1951 comprise the first chapter. From 1952 through 1981, Dudley Jensen was the head coach. His tenure marks the second chapter. The most recent years of the M team are detailed in the third chapter. The dev of the F team is in the fourth chapter. The thesis chronicles the events and records of the William and Mary varsity swimming teams over a period of 6 decades. Issues explored include coaching philosophies, budget, facilities, scholarships, and equipment.

194. O'CONNOR, K.A. Life stress and its effects on injury and performance among collegiate soccer players. MA in Physical Education, 1989 (C.J. Hardy)

The present study was designed to further investigate the effects of life stress on injury frequency and severity and on subjective and objective performance ratings. It also investigated the role that social support plays in these relationships. Ss (N=45) were members of the varsity soccer teams at a Division 1 univ. The Ss completed the Life Experience Survey for Athletes and the Social Support Questionnaire prior to the 1988 competitive season. Post season they completed Performance Evaluation Forms. Correlational anal were conducted to determine sig relationships between life stress and injury, and performance, and social support. The results evidenced a relationship between life stress and injury frequency and severity, and adverse effects on subjective performance. Negative Life Change and Object Loss were the variables most accountable for these relationships. It was also found that Fs react more adversely to a decrease in social support, and an increase in life stress, with regard to injury severity. Fs were also neg impacted by increases in life stress and social support with regard to subjective performance indices. The results of this study supports the notion that life stress is related to athletic injury. Moreover, the results indicate that life stress is also related to performance and that its impact is moderated by social support.

195. SMITH, J.C. JR. Athletic fund raising: Exploring the motives behind private donations. MA in Physical Education, 1989 (J.Billing)

The purpose of this study was to gather data on selected characteristics of donors to a successful NCAA Division I-A athletic prog, and determine the importance of each of a number of reasons which donors expressed for giving. Of the 1,500 members surveyed, 853 (56.3%) returned the questionnaire. Ranking of the motives indicate that enjoyment of watching athletics, loyalty to one's school, and the opportunity to obtain tickets are the most important motives in one's decision to contribute to the prog. The research found that the typical member was an alumnus, married to a nonalumnus, with an annual ave income of between $25,000 and $50,000 who has contributed from $501 to $1,000 per yr for 1 to 5 yrs and gives a lesser amount to other areas of the univ.

196. WOODARD, A.S. Target promotion in selected intercollegiate nonrevenue sports at the University of North Carolina at Chapel Hill. MA in Physical Education, 1989 (R. Hyatt)

This thesis sought to examine factors in attendance for nonrevenue sporting events at the UNC and isolate a target segment of the regular attenders in an effort to devise a comprehensive marketing plan for the nonrevenue sports at the Univ. This study surveyed fans at 7 diff athletic events at the UNC, representing 7 diff nonrevenue sports, during the 1981-82 school yr. This study was an attempt to discern how the students learned about the sporting event and why the students attended the event. Word of mouth and The Daily Tar Heel were the means by which most students learned about the event. The excitement and action of the sport, individual competition, and friends or family competing were the major causes for attending the event. A majority of the respondents indicated that they decided to attend the event 10 or more days prior to the event. Baseball was the most popular sport in overall attendance and gymnastics was the most frequently attended women's sporting event.

197. YUEN, G.E. The back handspring: Comparison of kinematic variables of the center of gravity following three different hand placements. MA in Physical Education, 1988 (E.W. Shields, Jr.)

The purpose of this study was to determine the most efficient hand placement position during a back handspring motion. 10 coll level F gymnasts served as Ss. The criterion used was vertical displacement of the CG during the rebound phase. The investigator attempted to control for rebound forces by meas peak angular extension velocities of the hip and knee joints. These extension velocities were not sig diff during the rebound. It was assumed that because these joint velocities were not diff then the rebound ht diff were the result of generating more angular momentum during the hand block phase. Turning the hands-in produced sig more vertical displacement, as compared to turning the hands-out. Greater vertical displacement may enable gymnasts to perform more difficult stunts requiring greater ht, which may be rewarded with virtuosity and originality points.

UNIVERSITY OF NORTH CAROLINA, GREENSBORO (J. HARRIS)
GREENSBORO, NORTH CAROLINA

198. LEVIN, S.R. *Acute effects of massage on the stress response*. MSc in Physical Education, 1990, 103 p. (D.J. Crews)

The purpose of this investigation was to examine the acute effects of massage as a means of reducing the response to stress; as well as to examine the physiological reactivity and psychological response to massage. Exp (massage) versus control (no massage) Ss (N=36) were compared using a variety of stressor tasks during a 2 day protocol. The stressor tasks were 20 min in duration and included mental arithmetic, a structured interview, the Stroop Color Word Test, and a video game. On Day 1, baseline meas for all Ss' psychosocial stress response were obtained. On Day 2, exp Ss received a massage while control Ss read *Science Digest*, then retested for psychosocial stress response. Physiological meas included HR, SBP, and DBP. Perceptions of stress were meas using the STAI, POMS, and AD-ACL scales. The physiological response to the treatment showed HR to be sig higher ($F(1,34) = 45.00$, $p<.001$) during and after the treatment in the massage gp compared to the control gp. SBP was also found to be sig higher ($F(1,34) = 13.14$, $p<.001$) after the treatment in the massage gp compared to the control gp. These results demonstrated increased autonomic response to massage compared to the no-massage control gp. In addition, STAI scores revealed sig diff ($F(4,136) = 6.93$, $p<.001$) between the gps. The massage gp reported lower levels of state anxiety during and after the treatment compared to the control gp. Of primary importance, the response to psychosocial stress and the recovery from stress were reduced following the massage treatment. The physiological meas during stress were sig lower ($F(1,34) = 6.28$, $p<.02$) in the massage gp compared to the control gp. The physiological level of recovery ($F(1,34) = 5.45$, $p<.03$), and the time to recovery ($F(1,34) = 16.66$, $p<.001$) were also sig lower among massage Ss. In addition, the massage gp reported sig less ($F(1,34) = 6.92$, $p<.02$) state anxiety following the stressor than the control gp indicating an enhanced recovery. It was concluded that massage reduces the physiological (HR and BP) response to and recovery from psychosocial stress. Also, massage tended to reduce anxiety following the psychosocial stress.

UNIVERSITY OF NORTH TEXAS **(R.S. WEINBERG)**
DENTON, TEXAS

199. STITCHER, T.P. The effects of goal setting on performance enhancement in a competitive athletic setting. EdD in College and University Teaching, 1989, 79 p. (P.A. Richardson)

The purpose of the investigation was to determine if goal setting has an effect on physical performance in a realistic, natural, and competitive athletic environment. Ss were 24 members of a NCAA Division III varsity men's lacrosse team assigned to either a goal-setting gp or a "do your best" gp. S performance was assessed on the skills of offensive assists, offensive ground balls, defensive ground balls, and defensive clears over a 16-game season. S commitment to the tasks was assessed through questionnaires at pre-season, mid-season, and post-season intervals. Results revealed no sig diff between the goal-setting gp and the "do your best" gp when performing lacrosse skills. However, results from the questionnaire indicated sig main effect for difficulty of the tasks. These results imply that athletes in the goal-setting gp felt that their goals were not realistic and that it was increasingly diff to reach their goals as the season progressed. Several factors may account for the lack of sig diff between athletes in the prescribed goal-setting gp and the "do your best" gp. First, members of the "do your best" gp indicated that they set their own goals despite the fact that they were not assigned specific goals. A second factor contributing to the lack of diff between gps was team size, which manifests itself in game plans and amt of playing time per athlete. Because the athlete does not have control over some factors which influence game situations, he or she may be hindered in reaching his or her goals, whether specified or individually chosen. Therefore, a research methodology that manipulates and attempts to control types of goal setting may not be appropriate or realistic when applied to the natural field environment of a highly organized competitive sport.

UNIVERSITY OF NORTHERN COLORADO **(C. CHAMBERLIN)**
GREELEY, COLORADO

200. AICINENA, S.J. An analysis and comparison of teacher and student behaviors in physical education and athletic settings. EdD in Physical Education, 1988, 122 p. (J. Steffen)

There were two purposes to this study. The first purpose was to determine if the behaviors comprising teacher instruction and composite teacher management time diff when individuals serve as PE teachers and coaches. The second purpose was to determine if the behaviors comprising student participation time and composite student management time diff for students and athletes. The Ss participating in this study were 28 PE teachers who also coached varsity BB teams. Data were also gathered upon the Ss' students and athletes, who were diff individuals. The schools were located in northeastern CO and southeastern WY. Teaching, coaching, student, and athlete behaviors were collected using the PE Teacher Assessment Instrument (PETAI). The PETAI was used to collect a continuous record of 10 teaching and coaching behaviors and 18 student and athlete behaviors. 1 class and 1 practice session were videotaped for each S, their students, and athletes. Classes were filmed in the first one third of a new indoor team sport unit. Light pre-game and Fri practices were not filmed. All videotaping was completed during the competitive season. Selected teacher and coach behaviors were anal using the repeated meas MANOVA procedure. Selected student and athlete behaviors were anal using the MANOVA procedure. The Ss were found to engage in planned presentation when teaching for a sig greater percentage of time than when coaching. The Ss, when coaching, were found to provide response presentation, performance fb, and motivational fb sig more frequently than when teaching. Students were observed to engage in the behaviors warm-up and review, and nonengaged game playing time for a sig greater percentage of time than athletes. Athletes were involved in engaged skill learning time for a sig greater percentage of time than students. No sig diff were found for the Ss in the behaviors of monitoring and management in the teaching and coaching settings. No sig diff were found between students and athletes in the behaviors of nonengaged skill learning time, engaged game playing time, and management.

201. IRWIN, R.L. Development of a collegiate trademark licensing administrative paradigm. EdD in Physical Education, 1990, 190 p. (D. Stotlar)

The purpose of this study was to dev an optimal coll trademark licensing paradigm through critical anal of existing profiles in coll and noncoll sport-related licensing prog. A survey instrument was designed to evaluate the licensing prog's organization structural dimensions of standardization and specialization. The survey instrument was distributed to licensing prog representatives at 220 coll and 6 noncoll sport-related enterprises. Sig diff were found to exist between the independently and nonindependently admin coll licensing prog on several factors relative to the organization structural dimensions of standardization and specialization. In addition, a sig diff was found for these 2 gps between the percentage of royalty revenues allocated for annual prog operating expenses. Sig diff were also found to exist between the coll and noncoll sport-related licensing prog on a no. of organizational structure issues under investigation. A sig diff was found to exist on the organization structural dimension of specialization M scores between the coll and noncoll sport-related licensing prog. A cluster anal revealed that the coll and noncoll sport-related licensing prog fell into 2 distinct clusters based on responses to the organization structural dimensions under investigation, indicating variation in the methods of operation relative to these factors. It was concluded that the reported diff were influenced by the adopted univ licensing prog management philosophy, interest in addressing elements inherently critical to licensing prog admin, and the licensing prog's internal human resource dev.

202. LEE, J.Y. Sport nationalism in the modern Olympic Games. EdD in Physical Education, 1990, 224 p. (A. Phillips)

The general purpose of this study was to anal sport nationalism in the modern Olympic Games and to ascertain, if possible, the future of sport nationalism in the Olympics. For this purpose, the writer compiled from Olympic history an understanding of past, present, and future concerns for sport nationalism in the Olympics. Seeking meaning from isolated facts relative to sport nationalism and anal the relations with politics made up the main thrust of this study. In addition, regularities and irregularities during the past Olympic Games, including the recently completed Seoul Olympics, were considered. In many nations, the Olympic sports have served functionally as a form of national identity. Successes by individuals have become almost symbolic of the nation. The modern Olympic Games are carried out in a framework of international relations involving exaggerated nationalism. Considering the recent trend of the Olympics influenced by drastic changes in world politics, however, the elements of sport nationalism have been superseded by the traits of a gigantic show business.

203. LIAO, F. Development and validation of a method for providing immediate quantitative feedback information on speed and angle of release in shot putting. EdD in Physical Education, 1990, 64 p. (J. Barham)

The purpose of the study was to dev and to validate a method of providing immediate quantitative fb information on speed and angle of release in shot putting. The achievement of max range in shot putting is primarily affected by the speed and angle of release of the shot. The training objective of a shot putter, therefore, is to max the speed and to optimize the angle of release of the shot. Learning to accomplish this objective requires some form of fb information on these 2 variables immediately after each put. No suitable method, prior to this study, was available for the provision of this information. Formulas were derived for the purpose of this study. The calculation required the meas of these variables: ht of release, range of put, deviation of put, and velocity component of the shot along the horizontally forward axis (X-axis). The ht of release was tape meas as a constant for each S. For each put, the range and deviation values were tape meas, and the velocity component along the X-axis was meas using a specially constructed timing apparatus. These quantities were input to the derived formulas for the calculation of the speed and angle of release of each shot put. The method was validated by employing high speed cinematography as the true meas of the speed and angle of release values. A nearly perfect r of .998 was found between the calculated speed of release values and those meas from the film. The reliability coefficient was found to be .997. The 95% confidence interval of error was found to be ±.173 m/s. A high r of .963 was found between the calculated angle of release values and those meas from the film. The reliability coefficient was found to be .928. The 95% confidence interval of error was found to be ±2°. Based on the above results, it was concluded that the fb system dev for this study is a precise, highly valid, and reliable system.

204. MATHIAS, K.E. A comparison of the effectiveness of interactive video in teaching the ability to analyze two motor skills in swimming. EdD in Physical Education, 1990, 106 p. (J. Steffen)

The primary purposes of the study were to dev an interactive videodisc application and conduct an initial comparison of interactive video instruction and traditional methods of teaching students to anal 2 motor skills in swimming. The secondary purposes were to compare whether interactive video has an effect on teaching students to anal intermediate versus complex skills in swimming and to examine the students' perception of the interactive video application. The sample consisted of 17 Ss from the Water Safety Instruction class at the Univ of Northern CO. Ss were divided into a control gp (n=11) receiving normal instruction along the guidelines of the American Red Cross and a treatment gp (n=6) receiving instruction through an interactive videodisc medium. Ss were taught to anal the freestyle and the butterfly strokes. A pre-post test design was implemented to meas diff in ability of the Ss in anal the 2 strokes. The Ss all improved in their ability to anal strokes. The treatment did not lead to a sig diff in cognitive or psychomotor anal scores. Ss who received the interactive videodisc instruction believed that it was an effective medium of teaching and that they would use it again if they received the opportunity. These results seem to indicate that interactive videodisc instruction is at least as effective as traditional instruction in teaching teachers to anal 2 swimming strokes. Refinement of current interactive videodisc instructional strategies could lead to diff results.

UNIVERSITY OF OREGON **(E.R. REUTER)**
EUGENE, OREGON

205. DAUT, H.C. Preparation and requirements for coaching high school athletics in Southern Mindanao, Philippines. MSc in Physical Education, 1990 (B.L. Sisley)

This study determined the preparation of coaches and solicited opinions of principals and coaches toward selected requirements for coaching in HS athletics in Southern Mindanao, Philippines. Principals and varsity head coaches in selected sports for the 1989-1990 school year completed separate questionnaires. Data on coaches' acad preparation, specific coursework, playing exp, and coaching exp were obtained. Opinions of principals toward acad preparation, employment status, specific coursework, playing and coaching exp requirements for coaching indicate agreement with standards for coaching preparation in the US. This study indicates that the majority of varsity head coaches in Southern Mindanao were lacking in preparation and coursework considered important for coaching. It implies a need for establishing a coaching certification prog to enhance the preparation and competence of HS coaches in Southern Mindanao and in all of the Philippines.

206. DUNCAN, T.E. The influence of social support and efficacy cognitions in the exercise behavior of sedentary adults: An interactional model. Ph.D. in Physical Education, 1989 (E. McAuley, M. Weiss)

Although there has been a considerable amt of research which establishes the beneficial effects of social support on health and well-being, relatively little work has focused on those processes by which social support influences health promoting behaviors. People's beliefs concerning their capacity to exercise control over their own motivation and behavior can have a sig impact on those physiological systems which affect the dev of chronic health dysfunctions. Various lines of research demonstrate converging evidence which suggests that self-efficacy operates as one such cognitive mediator linking psychosocial influences to pos health functioning. The present study employed structural equation modeling techniques to examine the relationships among social support, self-efficacy, and exercise behaviors of sedentary adults. These relationships were examined in the context of both cross-sectional and longitudinal designs to determine whether self-efficacy served a mediational function in explaining the influence of social support on exercise behaviors. Ss were sedentary adults (N=85) participating in a 5 mo federally funded exercise prog. Data pertaining to the variables of interest were collected during the 10th wk of the exercise prog, and again at prog termination. Cross-sectional anal confirmed that not only was self-efficacy an important determinant of concurrent exercise behaviors but, as predicted, self-efficacy also appeared to serve a mediational function in explaining the effect of social support on exercise behaviors. Results from the longitudinal anal, however, indicated that self-efficacy was less of a factor in determining subsequent exercise behaviors than were prior exercise behaviors. These results suggest that self-corrective action and self-referent thought may be necessary only in those circumstances when environmental demands far exceed one's perceived capabilities. Social support emerged as a sig source of efficacy information in both the cross-sectional and longitudinal models. Social networks may, therefore, play their most important role by encouraging individuals to persist in their endeavors and providing reassurance that their efforts will eventually be successful. Findings are discussed in the context of social cognitive theory, in which behavior, cognitive, and environmental influences operate interactively with one another in a process of reciprocal determinism.

207. EBBECK, V. Self-perception and motivational characteristics of tennis participants: The influence of age and skill. Ph.D. in Physical Education, 1990 (M.R. Weiss)

An integrated research approach to the study of motivation was adopted by incorporating variables from sport psych, motor dev, and motor learning/control subdisciplines. Specifically, the relationship of age and skill with self-perceptions and motivational characteristics of tennis participants was examined. M and F (N=240) ranged in age from 10 to 67 yrs. Professional tennis coaches verified the skill rating of each player using the National Tennis Rating Program introduced by the US Tennis Association. Individuals completed self-report scales meas global, self-worth, perceived tennis competence, tennis salience, intrinsic motivation, challenge motivational orientation, norm- and self-referenced conceptions of ability, causal attributions for success and failure, criteria for self-ability judgments, and competitive trait anxiety. Canonical correlation anal revealed that the set of age and skill variables was sig related to the set of psychosocial variables for both M and F. For M, age was pos associated with intrinsic motivation and controllable attributions for successful outcomes; but neg associated with tennis salience, competitive trait anxiety, and norm-referenced conceptions of ability. Increases in skill were associated with higher ratings of tennis salience, perceived tennis competence, global self-worth, preference for challenging tasks, intrinsic motivation, and internal and controllable attributions for success. For F, higher skill level was associated with increases in perceived tennis competence, intrinsic motivation, preference for challenging tasks, and tennis salience. Older, as compared to younger, F were lower in tennis salience, competitive trait anxiety, preference for challenging tasks, as well as norm- and self-referenced conceptions of ability. The percentage of variance explained in the psychosocial variables by age and skill was 27% and 44% for M and F, respectively. These findings suggest that an integrated research approach can extend our understanding of social-psych variables in the physical activity setting.

208. FAVERO, T.G. Changes in selected metabolic enzymes in response to endurance exercise: An examination of constant proportionality and qualitative mitochondrial alterations. MSc in Physical Education, 1989 (G.A. Klug)

The demands of chronic activity can alter many of the characteristics of skeletal muscle; among these are the enzymatic pathways for energy production and the mitochondrial profile. Chronic stimulation studies have shown the virtually unlimited capacity for adaptation due to the nature and duration of the contraction stimulus. Exercise studies have reproduced these results only to a limited extent; the purpose of this study was to examine the effects of long-duration and high-intensity exercise training periods on 6 metabolic enzymes and the mitochondria profile. Rats were exercised for periods of up to 26 wks duration after which muscle samples were taken and assayed for the enzymatic activity. The results indicate that values observed after exercise training can approach those values presented under the framework of chronic stimulation. They also indicate that alterations in skeletal muscle characteristics are a function of the total amt and duration of activity imposed upon the muscle system. Secondly, qualitative changes do occur in the mitochondria. These alterations are the result of a diff mitochondrial enzyme profile after training, a result which argues against total and complete constant proportionality of mitochondrial enzyme regulation.

209. GREEN, R.F. Dynamic lower extremity function: The effects of momentum manipulation during drop jumping. MSc in Physical Education, 1990 (R.N. Robertson)

The purpose of the study was to examine the effects of varied landing momentum during drop jumps. Drop ht and the mass of the Ss were manipulated. 4 Ss performed 5 trials in each of 9 conditions. The conditions were made up of all combinations of drop hts (20, 40, and 60 cm), and added masses (0, 7.5, and 15% of bw). Force and kinematic data were collected for each trial. 41 variables were generated which described the actions and forces during the eccentric and concentric phases of the jumps. Gp and within-S statistical anal were conducted. Although individuals demonstrated varied responses, it was generally shown that greater drop hts lead to increases in several kinetic variables from the eccentric phase. Sig diff due to added mass were fewer. Potentiation of the concentric phase was not indicated in any of the conditions, as changes in mechanical output for this phase were not observed.

210. HARMER, P.A.P. Paternalism and Special Olympics. Ph.D. in Physical Education, 1989 (E. Bressan)

Paternalism has been defined as an instance in which a party A interferes in the self-regarding actions of a second party S to ensure a benefit, or to prevent a harm, to S regardless of S's preferences or desires. Features of paternalism include altruistic motivation for the good of S alone. Contemplation and completion of the paternalistic interference entails a power imbalance between A & S in favor of A. The interference entails violation of moral rule in regards to S and requires justification by A. Arguments used to justify and reject paternalistic interference are described. Special Olympics is based on a philosophy of interaction with participants that holds that the mentally retarded are the moral equals of the intellectually normal and deserve to be treated with respect and acceptance. An argument has been developed that indicates that it is conceivable that 2 practices in Special Olympics may be morally questionable in that they may be paternalistic, and being paternalistic they may not be consistent with Special Olympics' philosophy of moral equality. The practices in question are affiliation procedures for prospective Special Olympians and the lack of participants on decision-making bodies in Special Olympics. The argument proposes 2 recommendations to restore moral integrity to Special Olympics in light of the possible inconsistency between Special Olympics' philosophy and practices. First, Special Olympics could change its philosophy to be in line with its practices. This would require Special Olympics to hold that the mentally retarded are not the moral equals of the intellectually normal. Second, Special Olympics could change its practices to be more accurate reflections of its philosophy. In the affiliation process, prospective Special Olympians should be educated and counseled about the benefits of Special Olympics as well as other alternatives, including nonparticipation, and then their positive assent to affiliation should be sought. Special Olympics should also open up opportunities for participants to be involved in meaningful decision-making within the organization as a means of enhancing participants' control over their own lives and as a proactive practice consistent with the philosophy of moral equality of mentally retarded individuals.

211. KIM, S.O. Self-efficacy and causal attribution of college students in a tennis competition. Ph.D. in Physical Education, 1990 (J. Broekhoff)

This study was designed to determine whether or not individuals maintain self-consistency, in relation to their expressed self-efficacy, in attributing performance outcome in a sport competition. Specifically, this study attempted to identify how self-efficacy cognition relates to causal attribution and the perception of effort expenditure, and how the perception of effort expenditure relates to causal attributions in a tennis competition. The study was grounded in the framework of self-consistency theory (Jones, 1973; Lecky, 1945; Secord and Backman, 1961). Self-consistency theory proposes that individuals in an achievement context maintain a degree of consistency with their beliefs about themselves by attributing their performance outcome to the causal factors that constituted the basis of their expectancy. Self-efficacy was hypothesized to be based on individuals' perceptions of the level of their personal capability (internality) and of the consistency (stability) with which they can mobilize their capability (controllability). 146 participants in intermediate and advanced tennis classes at the Univ of OR completed self-reports on a self-efficacy scale before a one-set, single tennis match, and self-reports of perceived effort expenditure and causal attribution, immediately following the competition. Separate multiple regression anal were conducted for winners and losers to determine the predictive power of self-efficacy with regard to causal attributions and perceived effort expenditure, and the predictive power of perceived effort expenditure on causal attributions. The results indicated that winners, as hypothesized, tended to maintain self-consistency by attributing their success to personally controllable and stable causes. Individuals' self-efficacy beliefs did not relate sig to perceived effort expenditure, regardless of performance outcome. However, winners who perceived themselves as expending a high effort tended to attribute their success more to internal and less to personally controllable causes. The results did not show any sig relationship between self-efficacy and causal ascription for the losers. No diff in these results were observed between M and F.

212. LUNDY-EKMAN, L. Soft neurological signs in clumsy children: Indicators of timing and force control dysfunction. Ph.D. in Physical Education, 1990 (M.H. Woollacott)

This dissertation investigated the neural basis for clumsiness in 7 and 8 yr old children. Clumsy children often show 2 diff types of abnormal mvmts on neurologic tests. The 2 types of abnormal mvmt may implicate basal ganglia or cerebellar dysfunction, although this interpretation of soft signs is controversial. The basal ganglia soft neurologic signs are extraneous motions. The cerebellar abnormal mvmts include tremor when reaching, inability to perform fast alternating mvmts, and inability to accurately reach a target. The soft signs were used to categorize the clumsy children as either basal ganglia or cerebellar. According to Keele and Ivry (1987), the basal ganglia are involved in force control and the cerebellum is involved in timing control. If this theory is correct, children with basal ganglia signs should be poorer at force control than normals and children with cerebellar signs. Children with cerebellar signs should be poorer at timing than normals and children with basal ganglia signs. 3 tasks were used to determine force and timing control. For the force control task, a horizontal target line was presented on a video screen and the Ss pressed a button to produce a force corresponding to the ht of the target line. Ss received visual fb about their force control on one-half of the trials, and no fb on the other trials. For the timing production task, the Ss produced a simple rhythm. For the time judgments, Ss listened to 2 pairs of tones and stated whether the second pair had a long or shorter amt of time between tones. As predicted, the children with basal ganglia signs performed sig worse on force control than the other children. The children with cerebellar signs were worse than the others on both production of timing and timing perception. These results support the theory that the basal ganglia are involved in force control and the cerebellum is important for timing control. The results show that specific diagnosis of motor dysfunction in clumsy children is possible, which may lead to dev of treatments aimed at improving identified timing or force control problems. The results also indicate that soft signs can predict specific motor control dysfunction in clumsy children.

213. NETHERY, V.M. Passive sensory mediation of ratings of perceived
exertion in trained and untrained males at light and moderate workloads.
Ph.D. in Physical Education, 1989 (G.A. Klug)

This study investigated the influence of passive distraction on RPE during exercise. Trained M cyclists and triathletes (Tr) and untrained M (U) completed four 15 min cycle ergometer sessions at 50% of max aerobic power (MAP) and four at 80% MAP, under diff sensory conditions (deprived (Dep), normal (Nor), visual (Vis), auditory (Aud)). All sessions were performed at approx the same time of day for each S with a minimum of 48 hrs between testing sessions. RPE and HR were recorded at 5 (T_1), 10 (T_2), and 15 (T_3) min of each session. A 2x(4x3) split-plot ANOVA assessed changes in RPE with separate anal conducted for each exercise intensity. At 50% MAP, Aud elicited lower RPE than Vis, Nor, and Dep ($p \leq 0.01$) whereas Dep was higher than Vis and Nor ($p \leq 0.01$). RPE increased as a function of exercise duration ($p \leq 0.0001$). Tr reported lower RPE than U only at T_3 during Dep. HR increased with exercise duration ($p \leq 0.01$)

but did not diff among sensory conditions or between Ss. Results at 80% MAP were qualitatively similar to 50% MAP with Aud eliciting lowest and Dep the highest RPE values. Diff in RPE among the sensory conditions increased with exercise duration ($p=0.013$). Tr reported lower RPE than U for all time periods and conditions ($p=0.017$), with the diff between Tr and U increasing with exercise duration. HR was higher for each successive time interval ($p \leq 0.01$) for all Ss but not diff among sensory conditions or between Ss. It was concluded that Aud distraction reduced and Dep state elevated RPE during exercise at low and moderate intensities, and that Tr reported lower RPE than U only during exercise at the higher workload. These results support the validity of hypothetical cognitive strategy models of sensory information processing that suggest a limited capacity to focus on sensations where stimulus strength and conscious selection determine the sensations to which one attends. They also support the hypothesis that enhanced self-efficacy and coping skills that result from endurance training are reflected by lower RPE during moderate intensity exercise.

214. OMAN, R.F. Efficacy cognitions, intrinsic motivation, and exercise behavior. MSc in Physical Education, 1989

This study was designed to examine the relationship between self-efficacy and intrinsic motivation and their relative effects on exercise behavior. Volunteer Ss ($N=109$) participated in an 8 wk aerobic fitness prog prior to and following which efficacy cognitions and meas of intrinsic motivation were assessed. Ss also indicated their perception of degree of success in the prog and their intention to continue exercising post-prog termination. Instructors monitored Ss' attendance at each class and this served as an indicant of exercise behavior. Reliability anal revealed the self-efficacy scales to have poor internal consistency and therefore precluded any anal of the relationships among self-efficacy, intrinsic motivation, and exercise behavior. However intrinsic motivation was found to be weakly related to attendance and Ss' confidence in their intentions to continue exercising post- prog. Additionally, Ss' perceptions of success exp in the prog were moderately related to post-prog levels of intrinsic motivation.

215. SNELL, C.R. Children's cognitions and moral judgment about the use of steroids in sport. MSc in Physical Education, 1990 (E. Bressan)

Athletes' use of drugs such as anabolic steroids appears on the increase. It is also indicated that adolescent athletes are at risk for steroid abuse. The purpose of this study is to examine information gained about children's perceptions of steroid use by athletes toward dev educ intervention strategies. An interview guide approach was employed to discover how 21 ele school children perceived the current situation with regard to steroids and sport, how they judged steroid use issues, and the sources of their information about steroids. The results suggest that children know a great deal about the potential costs and the benefits of steroid use. This knowledge comes from a variety of sources, and in many cases is incomplete. The judgments children make about steroids appear based on information they receive, directly or indirectly, from adults. Both the practical and theoretical implications of the findings are discussed.

216. STEVENS, S.C. A cost benefit analysis of declining numbers of women coaches: A social exchange theory perspective. MSc in Physical Education, 1989 (M.R. Weiss)

This study examined a possible explanation for factors influencing declining nos. of women coaches from a social exchange theory perspective. Current and former coaches identified similar costs and benefits of coaching but diff on the importance of those costs and benefits. Benefits relating to prog success, social athletic exp, and status were more important to current coaches than to former coaches as well as costs relating to neg athlete interactions. Current coaches were more likely to consider leaving coaching to retire, pursue a higher paying job outside of educ, to return to school, or because of children, while former coaches place a greater importance on time for friends and teaching but not coaching. Benefits, costs, satisfaction related to coaching, and satisfaction related to alternatives do play a role in an individual's decision to coach or not to coach. This study concluded that social exchange theory provides a viable framework from which to study coaching and coaching attrition.

UNIVERSITY OF QUEENSLAND **(B. QUIGLEY)**
BRISBANE, AUSTRALIA

217. CHAD, K.E. Post-exercise oxygen consumption: Effects of exercise intensity and manipulation of fat metabolism by ingestion of caffeine and dietary modifications. Ph.D. in Human Movement Studies, 1988

218. GINN, E.M. A method for determination of the upper limit of aerobic capacity. MA in Human Movement Studies, 1988

Critical power (Monod and Scherrer, 1965) was determined in 7 elite M kayak paddlers, and was calculated from the max work (W_{lim}) performed during time to exhaustion (T_{lim}) at 3 diff work rates (900, 750, and 600 watts) during kayak ergometry. Blood lactate concentration ([La]) was meas at 5-min intervals during prolonged (30 min) steady-rate exercise at 5 diff work rates relative to critical power (CP, CP±25W, CP±50W). It was shown that critical power is equivalent to the work rate which elicited a max lactate steady-state (the MLaSS), but that it is greater ($p<.005$) than the work rate at onset of blood lactate accumulation (W_{OBLA}). Following 6.5 wks of endurance training which included interval sessions and steady-rate exercise at the M HR meas during exercise at MLaSS: (1) critical power increased, though not sig; (2) W_{OBLA} increased; (3) work rate (in watts) at each 15-sec interval during a 4-min race simulation increased; and (4) total work output (kilojoules) during race simulation increased ($p<.005$). These results suggest that critical power provides a simple, noninvasive method of determining max aerobic power, a method of determining training pace which is superior to the W_{OBLA} method, and that training at this work rate improves critical power and performance indices.

219. NEAL, R.J. The influence of load on movement patterns. Ph.D. in Human Movement Studies, 1988

220. O'BRIEN, C.C. Motor development in clumsy, intellectually disabled, and Down's syndrome children: A comparative study. Ph.D. in Human Movement Studies, 1987

UNIVERSITY OF WESTERN ONTARIO (J.A. MACROW)
LONDON, ONTARIO, CANADA

221. BROWNLEE, E.A. The role of physical activity in combatting psychological distress in women. MA in Physical Education, 1989

The purpose of this study was to investigate the role that physical activity plays in combatting psycho distress in women. The primary objective of this study was to examine the effect that physical activity had on the psycho distress exp by women, as meas by symptoms of depression. A secondary objective was to determine the sig of the independent variables, primarily physical activity, in predicting the levels of psycho distress of women. A total of 110 women participated in the study by completing self-admin questionnaires. The questionnaires were designed to collect information regarding physical activity patterns, psycho health, and demographic characteristics. The results suggested that there was no sig relationship between the frequency of leisure-time physical activity and the amount of psycho distress exp, although such physical activity may buffer the effects of eventful exp or life events. The no. of life events exp within the past 12 mos was the only sig predictor of psycho distress identified.

222. CHRISTOPHER, P.D. The effects of moderate intensity maternal exercise on gross fetal morphology and the glycogen content of selected maternal tissues in rats. MA in Physical Education, 1989

F Sprague Dawley rats (75 days old) were used to examine the effects of maternal exercise on fetal well-being and maternal glycogen metabolism. The animals were randomly placed into 1 of 5 gps: control, nonpregnant, nonexercised rats (C); pregnant, nonexercised control rats (PNRC); exercised rats that stopped exercise once pregnant (PC); exercised rats that continued exercising till day 19 of gestation (PR) (term=21 days), and nonpregnant exercised rats that continued exercising (NPR) throughout the same time frame. Exercise consisted of treadmill running for 1 hr/day, 5 days/wk at 30m/min on a 10° incline. On day 20 of pregnancy maternal rats and age matched controls, were sacrificed. Placental wt, fetal bw, and selected fetal organ wts were recorded and anal. Maternal liver, soleus, and gastrocnemius were removed, weighed, and anal for glycogen content. No diff were found between the pregnant animals in the no. of fetuses/litter or fetal resorption sites. PR animals produced sig larger fetuses (2.34±0.1;1.83±0.05;1.98±0.02g), larger fetal kidneys (0.0165±0.0011;0.0123±0.0005;0.0130±0.006g), and larger fetal liver values (0.1947±0.0080;l671±0.0067;0.1737±0.0022g) than both PC and PNRC gps, respectively (P<0.05). PC animals showed sig smaller fetal heart (0.095±0.0003;0.0109±.0002;0.0114±0.006g) and brain wts (0.113+0.002;0.120±0.001;0.123±0.003) than the PNRC and PR gps, respectively and PC animals had larger placental wts than the PNRC animals (0.5275±0.09;0.495±0.07g) (P<0.05), respectively. Maternal data indicated that pregnancy may promote an increase in liver size as the PNRC, PC, and PR animals (17.6±0.7;20.0±1.2;19.5±0.7g) livers were larger than the NPR and C gps (14.6±0.7; 10.9±0.5g). However, the liver glycogen content was lowest in the pregnant gps (3.3±0.7;5.18±1.2;4.9±1.1g/100g tissue) in comparison to the NPR and C gps (8.1±0.6;6.6±0.7g/100g tissue). NPR animals contained more liver (8.1±0.6g/100g) and soleus (1.3±0.1g/100g) glycogen than the livers of the PNRC and PR gps (3.3±0.7;4.9±1.1g/100g, respectively), and more soleus glycogen than C animals (0.8±0.09g/100g). PR animals showed an increase in the glycogen storage of gastrocnemius red and white tissue (1.3±0.1;1.1±0.2g/100g) in comparison to the C, PNRC, and NPR gps (red tissue:0.5±0.05;0.7±0.08;0.7±0.1g/100g and white tissue: 0.3±0.05;0.6±0.1;0.4±0.1g/100g). It appears that exercise of this intensity in the nonpregnant state promotes liver and soleus glycogen storage. Late pregnancy, in combination with exercise of this intensity, increases maternal liver size, while decreasing maternal liver glycogen stores. Fetal data indicate that exercise of this intensity had no effect on fetal well-being. However, exercise before pregnancy and abrupt termination of this exercise just prior to pregnancy resulted in smaller fetal heart and brain wts, with larger placental wts than controls.

223. COURNEYA, K.S. The relationships among performance measures in intercollegiate baseball. MA in Physical Education, 1989

The purpose of the present study was to empirically test a proposed 3 level classification system of performance meas. The criterion of classification was the degree of performance validity associated with each class of performance meas (i.e., the degree to which each class is contaminated by nonperformance related variables). The categories consisted of tertiary performance meas (which have previously been labelled by others as performance outcome meas), secondary performance meas, and primary performance meas (which jointly have been previously labelled by others as team performance meas). The major hypothesis emanating from the model was that the secondary meas would be more closely related to the tertiary meas than would the primary meas. The second hypothesis, based on logical deduction, was that within the category of tertiary meas, ratio of final score would be more closely related to the primary and secondary meas than run differential and, finally, win/loss. Data were collected from 10 teams that competed in the NCAA during the 1988 season (n=762). The total sample was subdivided into home and away samples (n=381) and anal using Pearson r and forced entry multiple regression. The first hypothesis of the study was supported as the secondary meas were more closely related to the tertiary meas than were the primary meas. Contrary to the second major hypothesis, run differential (and not ratio of final score) was the best indicator of the primary and secondary performance meas, followed equally by ratio of final score and win/loss. In addition, it was found that the primary meas of performance had sig intra-gp diff. One set of primary meas—batting ave, slugging ave, on base percentage, and hits per total batters faced—were more closely related to the tertiary meas. The common factor among these meas was their inclusion of all hits. A second set of primary meas—home run ratio, home runs per total batters faced, fielding ave, stolen base +/-, and strike out-to-walk-ratio—were more distantly related to the tertiary meas. The common factor among these meas was their inclusion of a less sig occurrence (e.g., walks, errors, stolen bases, and home runs). It was also realized that the secondary meas were associated with the direct meas of the occurrence of runs. The results also revealed a pattern of diff between home and away samples. This diff appeared to be connected to the importance of offense and defense for the home and away teams respectively. It was concluded that primary meas should be used to assess performance whenever possible. It was also concluded that run differential is the best tertiary meas of performance in baseball.

224. COURSE, A.H. Movement education: A study in cultural diffusion. MA in Physical Education, 1989

The purpose of this study is to investigate the factors which influenced the diffusion of the system of mvmt educ as it evolved from European origins, English formalization, and North American adoption with particular attention to historical developments in Ont from 1947-1970. A modified version of Morrison's 5 classifications for anal a system of PE is used to assist in the selection and organization of historical evidence. These classifications include long term dev and change, innovation, process of transfer, resistance, and integration. The 2 hypotheses that are the focus of the investigation examine the antecedent and process factors suggested by Roger's diffusion paradigm. The first hypothesis proposes that historical events during the initial stages of the system's evolution contributed to resistance which later surfaced in the North American phase of adoption. The second hypothesis proposes that the delivery system by which mvmt educ was diffused in Ont was responsible for the system's particular form of integration. The study employs the historical-descriptive method. During the early stages of the system's evolution, historical evidence relevant to the first hypothesis is examined according to Morrison's classifications. Resistance to mvmt educ is considered as it surfaced in England, US, and specifically, Ont. Data for the second hypothesis were collected by means of a structured interview with 10 selected Ss. These Ss were professionals familiar with the system in teacher preparation and supervision, and were chosen with the recommendation of experts in the field of ele PE. Knowledge of historical events specific to the Ont Dept of Educ summer school prog (1947-70) was also a criterion. 5 of the S sample were born in Canada, whereas 5 were of English descent. 5 were first exposed to the system outside of the Ont mvmt educ network and 5 within the network. Taped interviews were conducted with the Ss who were questioned with regard to the factors which either facilitated or inhibited the diffusion and adoption of the system; the sources and/or themes of resistance; and the resource network responsible for the diffusion of mvmt educ in Ont from 1947-1970. Results of the study indicate that historical antecedents were tied to themes and sources of resistance. Evidence from English and American sources are consistent with results from the Ont S interviews which identify a feminine base of support and resistance by PE professionals who preferred the Olympic model of sport skill acquisition. Respondents also noted that the characteristics of the system contributed to resistance. Such characteristics indicate that the system was difficult to research, hard to communicate to others, and represented a nondominant view. The historical origins of these characteristics appear to be rooted in the philosophical orientation of early mvmt educ contributors—such as Delsarte, Dalcroze, and Laban—each of whom promoted an unorthodox approach to the study of human mvmt which did not easily fit the dominant research paradigm characteristic of the traditional view of PE. The results of the investigation also suggest that from 1947-1970 in Ont, through the promotional efforts of a resource system of English nationals, a determined effort was made to promote the English model of mvmt educ through the Ont Dept of Educ's summer school prog (1947-1970). Respondents acknowledged that Ont endorsed the English model of mvmt educ and attributed this to the influence of English trained visitors who dominated the visiting staff statistics from 1955-1970. A tangential observation which emerged from the study concerned the effects of delayed diffusion, in that Canada may have received a clearer, less confused conception of mvmt educ than in the US. Visiting English personnel were clearer on the distinction between the expressive and functional applications of the system, and early Canadian exp with mvmt educ began with the functional applications of the system. This dev may explain why Canadian pioneers in mvmt educ achieved distinctive success in the dev of a textbook representation of the broadest and most comprehensive interpretation of this area.

225. OLMSTED, B.J. Capillary supply to overloaded rat plantaris muscle. MA in Physical Education, 1989

The effect of compensatory overload on capillary supply in the rat plantaris muscle was studied over a 30 day time course. 36 M Sprague-Dawley rats were sacrificed at 2, 5, 7, 15, 21, and 30 days following surgical removal of the gastrocnemius muscle of one limb. Overloaded and contralateral contro' plantaris muscles of each animal were excised, weighed, and stained histochemically for myosin Lead ATPase and NADH-tetrazolium reductase activities. Ave wet wt of 30 day overloaded muscle was nearly 80% greater than that of the contralateral control. Fibre areas of all 3 fibre types were sig larger than controls by 30 days postsurgery, with type I fibres exhibiting the largest relative increase. The percentage of Type I fibres also increased sig by 30 days postsurgery. Capillary: fibre ratio in overloaded plantaris was sig diff from the 2 day control value by day 21. The no. of vessels around each fibre ranged from 2-10, and increased sig during the time course, most notably for Type I fibres (from a M of 4.43 at 2 days to 6.78 at 30 days overload). Capillary density did not change over the time course examined. Sharing factor was unchanged, and fibre area per capillary increased sig by 30 days overload. There was a pos linear relationship between fibre area and the no. of capillaries around fibres. These data demonstrate that capillary growth has occurred during compensatory overload of the rat plantaris muscle and that there may be a causal relationship between fibre growth and capillary growth.

226. PIZZIMENTI, M.A. Isokinetic resistance torque analysis of the Nautilus leg curl machine. MA in Physical Education, 1989

The present study assessed the capability of the Nautilus leg curl machine (NLCM) to reflect changes in the resistance torque offered to the user commensurate with the human torque pattern (HTP) generated by the knee flexor muscle gp. This assessment was completed in 3 steps. First, the resistance torque pattern from the NLCM was evaluated with an isokinetic dynamometer. Torque values were sampled via a microcomputer throughout a 120° ROM at 2 predetermined angular velocities of 30°/s and 60°/s. An ave resistance torque pattern was determined. Information concerning the system components was also collected to mathematically detail the resistance torque pattern afforded by the machine and its component parts. Secondly, data from a physically active adult M S pool (N=20) were collected employing a similar hardware configuration to that used for the NLCM samples. Ss performed 4 sets of 5 max contractions under restrained or unrestrained conditions at velocities of 30°/s and 60°/s. An ave HTP pattern was determined from these data. Finally, the HTP and NLCM patterns were expressed mathematically. Anal of linear regression coefficients established that the resistance torque pattern of the NLCM did not approx the torque-producing capabilities of the present S pool ($p<.001$). A suggested re-design of the NLCM system illustrated that such an approximation was possible.

227. QUEK. C.B. The effects of selected problem attributes and personality variables on decision style choices of high school basketball coaches. MA in Physical Education, 1989

This study investigated the influence of situation and/or personality of HS BB coaches on their decision styles and the relationship between decision styles and effectiveness. 51 M coaches of HS boys' senior BB teams participated in this study. Each S completed a set of questionnaires consisting of (1) Chelladurai, Haggerty, and Baxter's (1989) Decision Style Cases, (2) Fiedler's LPC Scale, and (3) Steers and Braunstein's Manifest Needs Questionnaire. The win/loss percentage was used as the effectiveness meas. The results showed that the situation and individual diff accounted for 24.1% and 14.9% of the variance in decision style choices respectively. Coaches' information and quality requirement had the most pronounced effects although all the 5 problem attributes had direct effects on decision style choices. The interactions of each personality variable with the problem attributes had minimal effect on the decision style choices. Achievement, Affiliation, and Autonomy appeared to collectively account for 14.9% of the variance in decision style choices. The HS coaches were more participative than the univ coaches of an earlier study. Finally, the autocratic style (AI) was the most preferred choice and consultation with individuals (CI) style was the least preferred choice (32.5% and 9.7% of the total decision style choices respectively).

228. RODGERS, C.D. The effect of streptozotocin-induced diabetes and thyroid hormone alterations on skeletal muscle contractile, histochemical, and biochemical properties. Ph.D. in Physical Education, 1988

The purpose of this study was to examine the role of diabetes-associated hypothyroidism in changes in plantaris muscle contractile, histochemical, and biochemical properties. 3 exp were designed to examine this relationship. Exp I evaluated the time course of diabetes-associated hypothyroidism and examined the effect of daily triiodothyronine (T3) supplementation on serum T3 and thyroxine (T4) levels in the diabetic rat. The effects of diabetes and diabetes in conjunction with T3 supplementation on plantaris muscle contractile, histochemical, and biochemical properties were examined in Exp II and III respectively. The results of Exp I indicated that T3 levels exhibited a transient change after diabetes inducement, decreasing within the first wk of the diabetic state and returning to normal by wk 3. In contrast, T4 levels were not sig affected by the diabetic state until after the second wk and remained in a reduced state through 15 wks of chronic streptozotocin (STZ)-induced diabetes. Daily supplementation of either 30, 50, or 75 ug/kg bw of T3 to diabetic animals instigated a normal neg fb response despite the diabetic state. These data would support the hypothesis that the alterations in thyroid hormone production observed in the diabetic state are a function of either an altered peripheral tissue responsiveness to thyroid hormone levels or a decrease in T4-5'-deiodinase activity. The effect of diabetes on plantaris muscle functional properties observed in this study was opposite to what would be expected in a hypothyroid state. Muscle temporal parameters were found to be sig faster while absolute force generating ability was decreased and specific force generating ability was unaltered. These findings would suggest that factors other than thyroid hormone levels are responsible for the decrease in temporal parameters and absolute force generating ability of the plantaris muscle associated with the diabetic state. No consistent diff were observed in histochemical or biochemical properties of skeletal muscle from diabetic rats. Contractile properties of the plantaris muscle in diabetic rats were not further affected by daily admin of T3. The lack of sig augmentations in temporal and force generating parameters suggests that skeletal muscle exposed to a diabetic-thyrotoxic state is not as affected by changes in serum T3 levels as would be skeletal muscle of a noninsulin deficient animal. Blood serum, histochemical, and biochemical data confirmed the presence of a hyperthyroid state despite normal muscle functional parameters. These data suggest that full expression of thyroid hormone levels is altered in the diabetic state. An interactive effect between insulin and thyroid hormone is postulated. The decline in insulin associated with the diabetic state may prevent full expression of thyroid hormone effects. Changes observed in skeletal muscle contractile, histochemical, and biochemical properties with diabetes are not a result of diabetes-associated hypothyroidism.

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229. AARON, E.A. The oxygen cost of exercise hyperpnea. Ph.D. in Physical Education, 1989 (J.A. Dempsey)

The purposes of this study were to determine, during exercise, the O_2 cost of exercise hyperpnea, the percentage of VO_2 used by the respiratory muscles, and whether the work of breathing (W_v) was fatiguing. The essential components of exercise hyperpnea; VE, transpulmonary (Ptp) and transdiaphragmatic (Pdi) pressures, flow rates, VO_2, and end-expiratory lung volume (EELV) were obtained during exercise. To determine the VO2 of the respiratory muscles (VO_2rm), resting Ss replicated the exercise W_v (Ptp:Vt loop), breathing frequency (Fb) and EELV. Mimicking was maintained for 5 min and hypocapnia was prevented. In 8 Ss (61 trials) mimicking max exercise hyperpnea, V_E, W_v, duty cycle (Ti/Ttot), integrated inspiratory Pdi with respect to time (Pdidt/min) and integrated expiratory Pg integrated with respect to time (Pgdt/min) were not statistically sig ($p<.05$) from that observed during exercise. In 32 trials, mimicking exercise hyperpnea from 70% max VO_2, the V_E, W_v, Fb, Vt were sig larger ($p<.05$) than during exercise while the other variables were not diff. EELV was within 8.6%±1.99% (x±sem) of the exercise value at both levels of mimicking. There was a sig r between the VO_2 of the respiratory muscles (VO_2rm) and both V_E ($r=.82$) and W_v ($r=.76$). The O_2 cost of the max exercise hyperpnea was 2.85±.13 mL O_2/L V_E and 1.07±.05 mLO_2/joule. The O_2 cost of exercise hyperpnea at 70% max VO_2 was 1.79±.16 mL O_2/L V_E and 1.42±.16mL O_2/joule. This represented 10.5±.7% (6.4-15.4%) and 4.32±.6% (1.4-7.4%) of the total VO_2 respectively. To investigate the effect of max exercise hyperpnea on the endurance of the respiratory muscles, 5 Ss continued mimicking until exhaustion or ≥ 15 min. All were able to sustain the W_v > 3 times (3-10 times) longer than the exercise duration. We conclude that the O_2 cost of max exercise hyperpnea is a substantial portion of the total body VO_2; however, sustaining this energy cost does not cause respiratory muscle fatigue.

230. BUDAY, M.T. A biomechanical analysis of the demi plie and grand plie. MS in Physical Education, 1989, 69 p.

As early as the seventeenth century, dance masters have acknowledged the importance of knowing and understanding the human body and the physical laws which act upon it. Unfortunately, little quantitative research is available to the dance comm regarding commonly practiced exercises. 6 F Ss, currently enrolled in advanced ballet and/or modern dance technique, performed 3 ***demi plies*** and 3 ***grand plies*** for biomechanical anal. The kinematic data revealed individual diff in the performance of both exercises as meas by knee angular displacement at the depth of each ***plie***. The kinetic data indicated variance in joint moments between the ***demi plie*** and the ***grand plie*** at the ankle, knee, and hip joints. An independent t-test revealed the ankle moments in the ***grand plie*** were nonsig ($p<0.05$) higher than the ***demi plie***. The knee moments in the ***grand plie*** were sig ($p<0.05$) higher than the ***demi plie***. The hip moments were diff in polarity between the 2 exercises. Joint moment power curves revealed variation in muscular usage between Ss; however, the joint most stressed, in all Ss, during the ***grand plie*** was the knee. It was concluded that the use of the ***demi plie*** may be helpful in preparing the dancer for the ***grand plie***. However, it is recommended that the ***grand plie*** be utilized for professional training and not for rec purposes.

231. CHEPYATOR-THOMSON, J.R. Stratification in an American secondary school: Issues of race, class, gender, and physical ability in physical education. Ph.D. in Physical Education, 1990 (C.D. Ennis)

The study examined the extent to which multicultural perspectives permeated participants' lives in the midwestern school. The purpose of the study was to investigate the extent to which stratification variables of race, class, gender, and physical ability (a) served as a means of self-stratification by the participants in the school, (b) affected curr and instructional decisions of PE teachers, and (c) influenced day to day decisions and participations of students. Ethnographic methods of inquiry included: nonparticipant observation, interviews, and review of school documents. Structured and open-ended questions were used in the interview sessions. Data were anal with constant comparison and triangulation methods. Several themes emerged from race, class, gender, and physical ability variables. These variables served as sources of conflict between students. The major findings of the study indicated that students' relationships in the midwestern school reflected individuals' relationships in the American society at large. Within the secondary school examined in this research, the fabric of students' lives was interwoven with exp inside and outside of PE classes. Specifically, students' racial backgrounds played a major role in their identity formations at the school. Additionally, the students separated themselves by racial backgrounds in the selection of PE classes and the patterns of participation and interaction. The relations between majority students (Caucasians) and minority students were strained due to white students' resentment of minority students, particularly black students, because of their easier access to institutions of higher educ based on affirmative action. Students' divisions by class were embedded in clique formations which were in turn related not only to the visible material possessions of students but also to the neighborhoods in which they lived. The formation of students into cliques limited their understandings of people from diff socio-economic and racial backgrounds. Student cliques interfered with activities in PE. Gender identification influenced students' selection of activities and their styles of participation in PE classes. Students perceived teachers to favor those students who were involved in extracurricular athletic activities.

232. CHOY, V.E. The effect of exogenous recombinant porcine somatotropin on pig common calcanean tendon biochemistry. MSc in Physical Education, 1990

40 orchidectomized M pigs (Duroc x Large white x Landrace) were subjected to saline or recombinant porcine somatotropin (rpSt) injections twice weekly for either a 2 mon or 3 mon period, and then sacrificed. Previous anal showed rpSt treated pigs tended to have a greater lean body mass than sacrifice wt-matched controls. Therefore, this study was designed to determine the rpSt treatment effect on the composition of common calcanean tendon matrix in accordance with the changes in lean body mass. Collagen concentration, proteoglycan concentration, and cell density were assessed by meas tissue concentrations of hydroxyproline, hexuronate, and DNA, respectively. Collagen and proteoglycan concentration were not diff between treated and control pigs. Statistical anal supported that animals treated with rpSt for 3 mos and sacrificed at $141\underline{+}4.0$ kg ($M\underline{+}s.e.$) had a lower (38%) DNA concentration than animals treated for 2 mos and sacrificed at $138\underline{+}2.6$ kg. Results suggest responsiveness of the tendon may be influenced by onset of treatment as well as duration. It is unclear whether or not this diff reflects an indirect response of the tendon to changes in the muscle or a direct response to the rpSt.

233. COWAN, K.L. The current status of dance education in Wisconsin and developmental influences. Ph.D. in Physical Education, 1990 (M.A. Brennan)

A descriptive study of the current status of dance educ in WI from 1987-1989. Three major areas of consideration are included in this comprehensive review of the current status of dance in WI: Dance in Educ, Dance Organizations, and Dance Companies. Sig events in the dev of dance in educ, dance organizations, and dance companies in the state which might have characterized or influenced the current status are highlighted.

234. CRESS, M.E. Muscle and bone response to exercise in elderly women. Ph.D. in Physical Education, 1989 (W.G. Reddan)

Lack of physical activity, that generally accompanies aging, is reflected in the alteration of the musculo-skeletal system. The purpose of this study was to evaluate VO_2max, muscular leg strength, muscle fiber morphology, and bone mineral content in response to a 50 wk aerobic/resistance exercise prog in healthy elderly F. The F (M age, 72.2±6.1) volunteered for either the exercise (E; N=17) or the control (C; N=10) gp. The exercise classes were held 3 times/wk for 50 wks; the E gp worked at 75% of their reserve HR by stair-walking with weighted backpacks, circuit stations with limb wts, calisthenics, and endurance dance. Testing was done initially (T1), at 20 wks (T2), and at 50 wks (T3). Time and meas taken were as follows: VO_2max (T1, T3), Vastus lateralis muscle biopsies (T1, T3), isokinetic knee extension/flexion (T1, T2, T3), and bone mineral content by dual photon absorptiometry (T1, T2, T3). Principal components statistical anal was performed on strength and bone mineral meas. For all meas, gp diff between time points were evaluated by MANOVA for repeated meas. Comparing the T3-T1 diff between gps, the E and C gp strength, muscle fiber area, and bone mineral changes were sig diff ($p<.05$). Leg strength increased in E, whereas C declined, particularly from T2 to T3 (winter mos). The fast twitch muscle fiber (Type IIB) area changes were due to increases in E, whereas C declined in muscle fiber area. The bone mineral index of the tibia and the femoral neck was sig higher in the E gp. Bone mineral index measures of the spine, forearm, and greater trochanter remained unchanged. VO_2max increased 18% in the E gp, this change was statistically sig ($p=.000$), although neither gp was sig diff from each other on T1 or T3. These data indicate healthy elderly F can increase aerobic capacity, leg strength, Type IIB muscle fiber area, and bone mineral index of the tibia and femoral neck with an aerobic/resistance exercise prog.

235. DOGAN, S. A biomechanical analysis of canine gait before and after unilateral total hip replacement. Ph.D. in Physical Education, 1989 (E.M. Roberts)

The purposes of this study were to quantify and assess the changes in pattern and magnitude of selected kinetic and kinematic variables during the stance phase of canine gait before and after unilateral cemented total hip replacement (THR) for the hind limbs in 5 dogs, and to determine the contributions of selected temporal, kinematic, and kinetic variables through quantitative and objective canine gait assessment. 5 healthy adult, mixed-breed dogs were selected for the THR. All dogs received identical prostheses and acetabular components, which were then cemented into the medullary canal and acetabulum. Prior to surgery, each dog was tested radiographically for joint normality. In order to establish the normality of kinematic and kinetic variables, each dog was leash-walked across a Kistler forceplate and filmed using a Milliken high speed motion picture camera preoperatively. The same procedure was followed postoperatively. The bilateral canine hind limbs were modeled as 3 rigid-link segments, and an inverse rigid body dynamic solution was applied to calculate joint reaction forces and moments of force at each joint before and after THR. Coefficients of variation of each ensemble ave of each joint kinetic variables were calculated. Graphical and statistical comparisons were made over time to determine the changes of the selected kinetic variables after THR. Repeated meas ANOVA, followed by a Sheffe post-hoc test, was used to determine the sig changes in the selected kinetic variables over time. Bilateral comparisons of the selected kinetic variables were made using a paired t-test. A sig diff was observed for all kinetic variables between preoperative and first mo postoperative levels and between first-mo and fourth-mo postoperative levels. There was no statistical diff between most kinetic variables preoperative and fourth-mo postoperative levels, indicating a return to normal joint loading. Bilateral comparison of these kinetic variables provided a similar result at the fourth-mo postoperative level.

236. DURANCZYK, D.M. Mechanical energy analysis of walking in elderly men. MSc in Physical Education, 1989 (E.M. Roberts)

The purpose of this study was to examine the mechanical energy and work of each segment and the whole body during gait in elderly M. The Ss were filmed in the sagittal plane. Cartesian coordinates representing the spatial location of the anatomical markers were established from reflective markers and the raw coordinate data were filtered. The mechanical energy levels and work indices of a 12 member linked segment model were calculated from the kinematics and anthropometric data using equations found in Winter (1979) and Pierrynowski et al. (1980). The stride characteristics in this study were similar to those found by Winter (1989). When a Wilcoxon two-sample rank sum test (alpha=0.05) was performed, there was a sig diff between the percent energy conservation values of this investigation and that of Pierrynowski et al. (1980). There appears to be no diff in the shape of the instantaneous energy curves or energy conservation pattern of the foot, leg, thigh, or arm when compared to a younger age cohort. There appear to be two trunk patterns for the translational and segmental energy components which accounts for an apparent trend of increased energy conservation in the trunk segments in the 3 oldest Ss compared to the 2 younger Ss.

237. HUGHES, B.G. The representation and reproduction of two-dimensional movement patterns. Ph.D. in Physical Education, 1989 (G.E. Stelmach)

The related issues of how mvmt patterns made in the absence of vision are mentally represented and how these representations are operated over were examined in 2 exp. Previous research has implied that degrees of abstraction of specific kinesthetic information occur as the task context demands. However, little is understood about the format, the contents, and the structure of such abstract representational systems. Nor has the utilization of available frames of reference been widely considered. The reported exp were intended to offer constraints on the possible characteristics of such representational systems for mvmts and to empirically contrast predictions associated with alternative systems. In both exp, Ss drew two-dimensional, three-segment criterion patterns with one limb and were asked to remember the pattern and all its topographic properties (segment lengths, intersegmental angles, etc.) so as to be able to reproduce the patterns as accurately as possible at 1 of 4 orientations on the table (at the criterion, 0°, or at 45°, 90°, or 135°, clockwise from it), with either the same or the contralateral limb, and in either the same or the reversed version. Unlike Exp 1, during which the orientation of the criterion form always coincided with the egocentric sagittal axis (as well as the environmental table and room axes), the criterion orientation in Exp 2 was varied. The time it took Ss to plan the reproduction attempts under the factorial combination of these conditions, taken in conjunction with the spatial errors of reproduction, was taken to be an indication of the cognitive cost of the mental transformations over the represented form required to conform to the instructions for mental transformations as well as the nature of the reference system(s) being utilized. In both exp, the data revealed that planning time for reproductions increased systematically near-linear as the instructed orientation of reproduction deviated from that of the criterion. However, having to alter the limb and/or version at reproduction had no systematic effect on planning latency. The error data indicated that systematic distortions were manifested in the reproductions and suggested that these distortions derive from the represented form and not from limb movement inaccuracy at certain locations within the workspace. The data also suggested that Ss will use egocentric referents to both specify the orientation of the criterion and to reproduce the form under diff spatial conditions, although it is possible that these referents are not identical in each phase, or among diff individual Ss. While the mental transformations suggested by the latency profiles closely resembled those associated with mental image rotation, and confirm predictions of other research on mvmt-based cognitive maps, several qualifications to such an interpretation are offered.

238. JANZEN, T.M. Spontaneous kicking in infants: A replication study. MSc in Physical Education, 1989

The purpose of this study was to replicate with improved technology, research by Thelen, Bradshaw, and Ward (1981); which claimed that because of the similarities found between the temporal phases of infant supine kicking and adult walking, a human spinal pattern generator controls both. A second purpose was to investigate 3 hypotheses for why infants kicked at certain frequencies. 7 infants, ranging in age from 4-12 wks, were videotaped using a NAC High Speed Videocamera while performing spontaneous, supine kicking for 5 min. Temporal data were reduced from the videotape for the following parameters: interkick interval, flexion phase, intrakick pause, and extension phase. 4 Ss from the present study had similar results to Thelen et al. (1981), while 3 Ss were diff in terms of time spent in stance and swing. It was concluded that: 1) the results from the present study could not distinguish whether the "spinal generator" was responsible for producing kicks that could be the precursor of several forms of gait, or because of an artifact due to the definitions of the temporal parameters, 2) the diff observed among infants were not due to arousal. Infants with a larger ratio of leg length to total body length, and those having a higher Ponderal Index, did not perform fewer no. of kicks.

239. KOLTYN, K.F. Psychobiologic responses to paced scuba exercise. Ph.D. in Physical Education, 1990 (W.P. Morgan)

The purpose of this investigation was to evaluate the effect of paced underwater exercise on state anxiety, body awareness, perception of effort, breathing distress, core temp, HR, respiration rate, and use of compressed air. Exploratory research involving core temp responses and state anxiety supported the hypothesis that anxiety reduction following exercise may be caused by elevations in core temp. In the first pilot study, 7 M Ss exp no reduction in state anxiety when precooled for 30-min in a whirlpool bath (25°C) prior to walking at 70% VO_{2max} for 30-min. These same Ss exp a decrease in state anxiety in the control condition which consisted of sitting quietly for 30-min prior to walking. Core temp responses differed between the two conditions. In pilot study II, 5 M and 5 F scuba divers completed 3 paced, 200-yd underwater swims (2.0 ft/sec, 1.7 ft/sec, 1.4 ft/sec). State anxiety increased sig following the paced swims at 1.7 ft/sec ($P<0.06$) and 2.0 ft/sec ($P<0.03$). In the final investigation, 15 certified M scuba divers finned underwater at a pace of 1.7 ft/sec (1.13 mph) for 20-min. The DVs were anal with a series of repeated meas ANOVA. Core temp did not increase sig during exercise. HR, respiration rate, and the use of compressed air increased sig during exercise ($P<0.01$). RPE for the legs and breathing distress also increased sig ($P<0.01$) during exercise. Body awareness increased sig ($P<0.01$) immediately post-exercise and then fell to baseline values 15-min post-exercise. There was a sig decrease in state anxiety ($P<0.05$), and this reduction was observed 15-min post-exercise. These results indicate that reductions in state anxiety occur following 20-min of underwater exercise at a pace of 1.7 ft/sec. It is concluded that state anxiety decreases following 20-min of underwater exercise, and this anxiolytic effect occurs in the absence of elevated core temp.

240. SCHAUER, J.E. Dehydroepiandrosterone and a ß-agonist affect energy transduction and alter antioxidant enzymes: Influence of chronic training and acute exercise in rats. Ph.D. in Physical Education, 1990 (P. Hanson)

Although dehydroepiandrosterone (DHEA), a thermogenic agent, and phenethanolamines/ß-agonists, muscle protein accumulating agents, appear to be lipolytic, each transduces energy from fat depots in a diff manner; DHEA to heat production and phenethanolamines/ß-agonists to muscle accumulation. Acute and/or chronic exercise can reduce food intake, induce specific enzymes, and alter metabolic pathways. Chronic exercise did not alter the typical DHEA induced liver enzymes (Mitochondrial sn-glycerol-3-phosphate dehydrogenase, cytosolic Malic Enzyme) or reduce bw gain in DHEA fed (0.4% of the diet) rats. Bw gain of rats fed 5 ppm of the ß-agonist (BA) (Merck L-644,969) was not reduced by chronic exercise nor were similar liver enzymes induced as with DHEA. Liver cytosolic glucose-6-phosphate dehydrogenase (G6P) was unaffected by acute exercise in either trained (Tr) or untrained (U) Control and ß-agonist-fed rats. Acute exercise increased G6P activity in UDHEA-fed rats. Exercise training increased G6P activity in DHEA-fed rats. Muscle mitochondrial alanine amino transferase (ALT) activity was increased with acute exercise in the UBA rat. The ß-agonist reduced muscle cytosolic glutamate and glutamine, indicating reduced protein degradation. Feeding 0.4% DHEA decreased hepatic cytosolic (c) selenium-dependent glutathione peroxidase (GPX), (-26%, $P<0.0001$) and increased hepatic mitochondrial (m) Mn superoxide dismutase (SOD), (+38%, $P<0.001$). DHEA decreased myocardial c-GPX (-21%, $P<0.05$) when compared to a ß-agonist (L644969 Merck and Co.) (ßA) fed at 5 ppm but neither diff from the Control (C). In contrast, the ßA increased hepatic m-GPX (+25%, $P<0.05$). In skeletal muscle, DHEA and ßA decreased muscle c-GPX by 20% and 12%, respectively ($P<0.0009$). DHEA increased both muscle (+20%, $P<0.01$) and myocardial (+20%,

$P<0.05$) c-glutathione S-transferase (GST) over ßA (+20%, $P<0.01$) but neither was sig dif from C. Similar to DHEA, chronic training (Tr) (1hr/day, 5 days/wk at 27 m/min, 15% grade on treadmill) decreased hepatic c-GPX (-16%, $P<0.003$). Tr elevated muscle c-GPX (+36% $P<0.05$) in C. Tr increased myocardial c-GPX by 28% in the ßA-treated rats whereas Tr decreased myocardial c-GPX by 22% in the C ($P<0.05$), interaction). One hr of acute exercise (Ex) 70% VO_{2max} relative work load) decreased hepatic homogenate catalase (-12%, $P<0.02$) and increased hepatic m-Mn SOD (+28%, $P<0.03$). Ex decreased myocardial c-GST ($P<0.05$) only in the DHEA-treated rats.

241. SCHMIDT, K. The effects of age and endurance training on rat adrenal tissue: A morphological analysis and determination of catecholamine content. MSc in Physical Education, 1990

The purpose of the present investigation was to determine the effects of endurance exercise training on adrenal morphology and epinephrine content in young and old Fischer 344 rats. Animals from each gp underwent 8 wks of treadmill running (60 min/day, 6 days/wk). 72 hr following the last training session, animals were killed and the adrenals removed for subsequent anal. A training effect was demonstrated by the increases in left ventricular wt (19%-young; 8% old) in the trained animals as compared to untrained controls. Trained animals had larger total adrenal volumes (nl/g bw) than untrained controls ($p<0.001$) (Young Control (YC)=59.4 ± 7; Young Exercise (YE)=81.9 ± 7; Old Control (OC)= 47.2 ± 3; Old Exercise (OE)= 58.0 ± 7). Trained animals had larger cortical volumes (nl/g bw) compared to untrained controls ($p<0.001$) (YC=54.8 ± 7; YE=75.7 ± 6; OC=43.1 ± 4; OE=52.8 ± 7). Trained animals had larger medullary volumes (nl/g bw) than untrained controls ($p<0.0005$) (YC=4.6 ± 0.5; YE=6.3 ± 0.3; OC=4.1 ± 0.5; OE= 5.2 ± 0.9). trained animals had higher medullary epinephrine content (ug) than untrained controls ($p<0.005$) (YC=44.0 ± 9.6; YE=53.1 ± 21.7; OC= 64.5 ± 2.3; OE= 80.1 ± 11.9). Young animals had larger total adrenal and cortical volumes (nl/g bw) than old animals ($p<0.001$). The medulla accounted for a greater proportion of the total volume in the old as compared to the young animals ($p<0.005$) (YC= 7.82 ± 0.87%; YE= 7.52 ± 2.88%; OC= 8.82 ± 1.62%; OE= 9.11 ± 1.96%). Old animals had higher levels of adrenal epinephrine and norepinephrine (ug/gland) than young animals. There were no diff in epinephrine or norepinephrine concentration (ug/ul medulla) based on either age or training. It was concluded that the training-induced increase in adrenal epinephrine content is due to an increase in the size of the medulla, and not to a greater medullary epinephrine concentration. Further, that adrenal medullary volume and epinephrine content both increase with age. Similar responses to training occur in old as compared to young animals, but to a lesser extent.

242. TOMMERUP, L. Exercise training attenuates reduction in 23-hour and resting metabolic rates induced by dietary restriction. MSc in Physical Education, 1990 (D.L. Ballor)

Daily total energy expenditures (TOTMR) and resting metabolic rate (RMR) have been shown to decline with loss of body mass and dietary restriction. To determine whether exercise affects TOTMR and RMR diff under diff levels of energy intake, 48 M Sprague-Dawley rats (100 days old, 351 g) were assigned to either ad lib.-feeding (AL), moderate dietary restriction (MD), or severe dietary restriction (SD) and either exercise (E) or no exercise for 10 wks. Exercise was treadmill running on a 15% incline at 29 m/min, for 50 min/day, 5 days/wk. Fasting VO_2 (TOTMR and RMR) was meas (15 hrs post-absorptive, 15 hrs post-exercise) during wks 2 & 10. At wk 10, the reduction in TOTMR and RMR induced by dietary restriction was partially offset by exercise in the moderate diet (MDE>MD, $p<.05$) but not the severe diet (SDE=SD) gps. Also at wk 10, ALE had a sig higher ($p<.05$) TOTMR and RMR than AL. The degree of dietary restriction may affect the mechanisms by which exercise maintains TOTMR and RMR.

243. VOLOVSEK, A.J. Physiological responses to changes in exercise:rest ratios and work rates during interval exercise. MSc in Physical Education, 1990

This study assessed the metabolic and physiologic responses to diff exercise to rest ratios (E:R) (2:1, 1:1, 1:2) and work rates (90 or 110% VO_2max) during interval exercise. 8 M (VO_2max=4.7 ± 0.2 l/min) underwent six 15-min long protocols with an interval length of 1 min using a cycle ergometer. Calibrated wts were used to determine work rate which was estimated as follows: kpm= (% of VO_2 . VO_2(ml/l) - rest VO_2)/2. Total work (kJ), VO_2 (l/min and ml/kg/min), HR (bpm), and plasma lactate (mmol/l) were monitored. Total work was sig diff ($p<0.05$) in all 6 protocols. With increases in E:R and work rate, VO_2 and HR increased ($p<0.05$). 15 min ave values ranged from 40% to 81% of max and 62% to 91% of max for VO_2 and HR, respectively. Plasma lactate concentrations nearly doubled at each E:R when work rate was increased from 90 to 110% VO_2max. The 2:1-110% protocol elicited plasma lactates (10.7 mmol/l) that exceeded those values meas immediately following max exercise tests (10.5 mmol/l). The other protocols elicited plasma lactate concentrations that were elevated from rest ($P<0.05$) but were at a level which allowed exercise to continue. These data suggest that when performing high intensity interval work, work rates should be limited to 110% of VO_2max and the exercise to rest ratio be no greater than 1:1.

244. WANTA, D. Metabolic responses to graded downhill walking. MSc in Physical Education, 1989 (F.J. Nagle)

The metabolic responses to graded downhill walking were studied in this exp. 10 healthy M walked downhill at both 90 m/min and 105 m/min for 6 min at each of the following % grades: 0%, -3%, -6%, -9%, -12%, -15%, and -18%. HR, step frequency, and VO_2 was meas during each walking bout. Changes in % grade of downhill walking elicited only minor changes in mean HR and mean step frequency. The observed min mean VO_2 for 90 m/min was observed at -9% while -12% grade elicited the lowest mean VO_2 at 105 m/min although the pattern of responses between the 2 speeds were similar. The required VO_2 for grades -6% through -15% do not diff sig from each other for either walking speed. However, the mean of these 4 grades diff from 0%, -3%, and -18% suggesting the optimal or most economical grade for downhill walking lies within this range. Inspection of individual VO_2 responses suggests that this most economical grade for downhill treadmill walking is variable depending on walking speed and perhaps S gait characteristics. Since the metabolic cost of the intrastep pos vertical displacement of the center of mass performed within the step cycle is 3 to 6 times greater than the energy cost of the neg intrastep displacement of the center of mass, the treadmill grade requiring min metabolic energy cost for downhill walking is the grade where the intrastep pos vertical displacement of the center of mass becomes zero.

245. ZHU, W.M. Appropriateness of the Rasch Poisson model for psychomotor test scores. Ph.D. in Physical Education, 1990 (M.J. Safrit)

The purpose of this study was to examine the model-data fit of the Rasch Poisson Counts model using simulated data and 2 sets of psychomotor time-limit test data. 40 data sets were generated with variation in difficulties (-2.0, -2.5, -3.0, -4.0), sample sizes (50, 150, 500, 1500), and max steps (90, 130). Ncsetup, a nationally used, 1 min sit-up test was admin in NCYFS I (N=8800) and 3 diff 1-min sit-up tests were admin in UWSITUP (N=426). The response vectors were anal via MASI, a computer prog written for the Rasch Poisson Counts model. The correlation coefficient and the root mean squared error were employed as indicators of accuracy of estimation, and the Kolmogorov-Smirnov (K-S) test was used to evaluate the model-data fit. Both difficulty and ability parameters for the simulated data were recovered very well by the model. Accurate estimations were obtained for all sample sizes, including a very small one (N=50). The K-S test demonstrated its sensitivity in detecting deviations. Graphs were used to verify the results of the K-S test. After the calibrations of 2 sets of sit-up test data, the item and examinees, and examinees from diff subgps were compared under a common metric. The difficulty of Ncsitup seemed appropriate for assessment of youths' abdominal muscle strength and endurance. For the individual whose estimated ability was below -1.0 (score of 5) or above 1.26 (score of 60), an easier or harder item may be more appropriate. Whether the feet were anchored seemed more important than arm position in determining the difficulty of a sit-up task. The goodness-of-fit of the model to the sit-up data was not satisfactory, which could be due to the dependency, or fatigue, factor of the time-limit psychomotor data. The effect of the dependency characteristic of the time-limit psychomotor data on the Rasch Poisson Counts model should be examined in future studies.

WASHINGTON STATE UNIVERSITY (K.P. DEPAUW)
PULLMAN, WASHINGTON

246. FRANCIS, M.E. Coverage of African American basketball athletes in Sports Illustrated (1954 to 1986). MS in Physical Education, 1990, 97 p. (G.M. Hulac)

"Sport reflects society" is a tenet of sport sociologists. As such, constituents of sport are expected to reflect general attitudes within American society. Consequently, the treatment of African Americans in society may be mirrored in sport constituents, for example, the sports media. An investigation of the sport media treatment of African American athletes can serve two functions: one which describes the actual coverage given these athletes, and a second comments upon the degree to which the results from the depiction of black athletes by the sport media reflect that of the depiction of blacks in the general media. The purpose of this study was to investigate the representation of African American athletes in Sports Illustrated during 5 selected NCAA Div I BB seasons between 1954 and 1986. Variables examined were: a) percentage of total articles which mentioned African Americans, b) feature articles on African Americans, c) issues mentioned in the feature articles, and d) the presence or absence of stereotypical reporting in feature articles. The conclusion of the findings was that African American BB athletes were according increasing amounts of coverage and that feature articles were often pos. The findings indicated that as the no. of athletes increased, there was an analogous rise in both total articles which mention the athletes and feature articles on the athletes. Feature articles on African American athletes often depicted the athletes in a nonstereotypical fashion. Similarly, there were more articles which addressed success issues than problem ones. Implications from the study suggested that coverage accorded African American athletes did not fully reflect the media treatment of African Americans in society. Additionally, intercoll BB and the reporting of it by Sports Illustrated broke ground upon which society has yet to tread.

247. HONG, Y.C. Pre- and post-knowledge of results intervals and motor performance of mentally retarded individuals. MS in Physical Education, 1989, 60 p. (K.P. DePauw)

The purpose of this study was to investigate the effects of post-KR and pre-KR intervals upon EMR children's motor performance. The Ss included 60 Korean EMR children, ranging in age from 8 yrs to 15 yrs, 3 mos. Each S was randomly assigned to a 5-, 10-, 15-sec post-KR interval gp and performed 15 trials of a simple linear positioning task under the 0-sec or 6-sec pre-KR interval condition respectively. The data were anal through ANOVA with repeated meas and Duncan's New Multiple Range test. Findings of this study included the following: (a) the gp with 5-sec post-KR interval and immediate pre-KR had sig less error than the gp with 5-sec post-KR interval and 5-sec pre-KR delay, (b) the gp with 10-sec post-KR interval and 5-sec pre-KR delay had sig less error than the gp with the 10-sec post-KR interval and immediate pre-KR, (c) the gp with the 15-sec post-KR interval and 5-sec pre-KR delay had sig less error than the gp with the 15-sec post-KR interval and immediate pre-KR, (d) there was no sig diff between the 10-sec and 15-sec post-KR interval under 5-sec KR delay, (e) under 5-sec KR delay, Ss sig decreased their AE with longer post-KR interval, and (f) the Ss showed greater AE beyond the third block (9 trials). Based upon the results of this study, it is suggested that the EMR child will produce min error on a fine motor task with the 5-sec post-KR interval under immediate KR or with the 10-sec and 15-sec post-KR interval under the 5-sec KR delay.

248. RINALDI, N.E. Evaluation of the Washington State University intramural sports program. MS in Physical Education, 1989, 89 p. (S. Hupp)

A three part telephone questionnaire was designed as the tool to investigate students' reasons for and barriers to participation and prog satisfaction of team sport participants in the WA State Univ Intramural Sports prog. A random sample of 600 students, stratified by gender and class level, was drawn. Chi-square anal was used as the primary statistical tool. Of the 600 sampled students, 507 completed the survey and 230 were identified as participants. The majority of the participant respondents were individuals living on campus, M, and younger in age. Of the total respondents, 90.9% had previous involvement in organized sport prog. The vast majority of the participant respondents participated in team sports and competitive leagues. Reasons for participation and barriers to participation were varied and some gender diff were apparent. Based upon the anal of the data, it can be stated that the majority of the team sport participants in the WA State Univ Intramural Sports prog for the 1988-1989 school yr were satisfied to very satisfied with the prog. No sig relationships were found between prog satisfaction and the independent variables of gender, previous involvement and noninvolvement in organized sport prog, league participation, and class level.

WEST CHESTER UNIVERSITY **(M. LANK)**
WEST CHESTER, PENNSYLVANIA

249. BAUER, J.A. The effects of localized external body cooling as an aid to thermoregulation in a hot and humid environment. MSc in Physical Education, 1989

The purpose of this study was to determine if a passive training aid could be dev which would assist the body in thermoregulation during exercise in a hot humid environment and to evaluate its effectiveness. Such an aid may allow the athlete to continue training in hot, humid climates with less chance of suffering heat stress complications. The Ss selected for this exp were 6 healthy M between 25 and 30 yrs of age. Each S completed a submax treadmill test under each of 3 test conditions: (1) wearing no exp vest, (2) wearing exp cold vest, and (3) wearing exp vest filled with sand to match the wt of the cold vest. Time, HR, BP, and perceived exertion were recorded during testing. Work was calculated based on the time it took each S to reach his target HR. A repeated meas ANOVA was used to compare responses to the 3 test conditions. No statistically sig diff were found for the various test conditions. Using the exp cold vest (ECV) neither improved nor degraded S performance during the submax treadmill testing.

WEST VIRGINIA UNIVERSITY **(A. SORINE)**
MORGANTOWN, WEST VIRGINIA

250. CELTNIEKS, V. A multidimensional description of one individual's student teaching experience in physical education. EdD in Physical Education, 1989

The purpose of this study was to describe in multidimensional terms the changes that occurred during one student's practice teaching exp in PE. This was accomplished by observing a student teacher 2 to 4 times a wk during her whole exp in HS and ELE PE using the WV Univ Teacher Evaluation System (WVUTES), a low inference data collection method of pupil and student teacher behaviors, and interviews with the student teacher, the cooperating teachers, and the univ supervisor. The graphed data were visually inspected to determine if any trend, level, or change in variability existed and then compared to the information gathered from the interviews. HS and ELE school data were compared to determine if any sig diff existed in the student teacher and pupil behaviors. The activities that were presented and how they were organized were scrutinized to determine if any similarities or diff could be observed. The most sig finding of this study was that the performance of the student teacher was a function of the activity and not of time or placement. Little improvement was noted in teaching and learning behaviors, which was inconsistent with the reports of the student teacher, cooperating teachers, and univ supervisor. Changes that occurred in student teacher and pupil behavior were a general decrease in instruction, an increase in management, a decrease in motor engagement, and an increase in waiting. The attitudes of the student teacher, cooperating teachers, and univ supervisor toward each other were pos except when fb was lacking. The student teacher wanted to be more creative; the cooperating teachers wanted more time in the exp; and the univ supervisor wanted more constructive criticism. They all felt that class control and dealing with discipline problems quickly was important. The author has proffered the following recommendations: Study more student teachers at regular intervals; study the effect of various supervisory fb on student teaching performance; and study student teachers, cooperating teachers, and univ supervisors who have been trained with the WVUTES to determine if student teacher and pupil behaviors are sig improved during the exp.

251. CONDINO, F.J. Future trends in collegiate athletics at the NCAA Division II and III level: A Delphi technique. EdD in Physical Education, 1987

The purpose of the study was to forecast the future direction of intercoll athletics at the NCAA Division II and III level with regard to budget, enrollment, facilities, governance, prog, and staffing. The study also sought: (1) to forecast occurrences or trends that could take place and their chronology and (2) to forecast the desirability and impact of the occurrences. A three-round Delphi Technique was utilized in the study. The Delphi is a method of soliciting a consensus of expert opinion through a series of questionnaires with controlled opinion fb. The experts utilized in the study were ADs at Division II and III with at least 5 yrs exp. 100 randomly selected ADs were initially contacted. The total no. that responded and met the exp criteria numbered 26 for the first questionnaire. The response rate for the second and third questionnaire was 92% of the first questionnaire or 24 respondents. The respondents were asked to project future occurrences and rate the forecasts according to time, impact, and desirability. The time was anal according to the median. The impact and desirability were assessed according to the mean. The experts projected 32 forecasts in 7 diff areas. The 7 areas, in which the forecasts were categorized, were: budget and finance, enrollment, facilities, governance, participation, prog, and staffing. 19 of the forecasts were projected to fall within time frame A (1987-1990), 9 in time frame B (1991-1995), 1 in time frame C (1996-2000), 1 in time frame D (2001-2010), 1 in time frame E (after 2010), and 1 in time frame F (never).

252. CUNEEN, J. A preparation model for NCAA Division I and II athletic administrators. EdD in Physical Education, 1988

The purpose of this research was to ascertain, through direct examination of the total population of NCAA Division I and II ADs, a grad curr model for AD preparation. An original survey instrument, dev by the investigator but based upon Hay's (1986) Proposed Sports Management and Related Strategies Model, was mailed to 569 ADs. Total return rate was 54%. Respondents rated each of 41 course items using a Likert type scale ranging from "Essential" to "Not Important." Courses were grouped into Specialized Cores to reflect acad competencies from interdisciplinary areas. Data showed that 17 courses were perceived by the ADs as "Important" or beyond according to the acceptance criteria of a M rating of 3.5. A 2 x 3 ANOVA, with Duncan's Multiple Range Test used to meas M between sig diff, indicated that the main effects of divisional affiliation and programmatical status, and the interaction of each, influenced the ADs' perceptions of important course work. It was concluded that a curr model for grad study in AD should be a collaborative prog reflecting interdisciplinary structure from units of PE, higher educ admin, and management.

253. DAUGHERTY, E.P. The gain and loss of acclimatization as older men work in heat. EdD in Physical Education, 1990

There is a paucity of evidence to support the hypothesis that there is no sig diff (NSD) between the rate of acclimatization gain and loss of young and old men as they work in a hot environment. 10 young men [Gp 1 (M age 24.8 yrs)] and 5 older men [Gp 2 (M age 64.4 yrs)] volunteered to complete a 39 day exercise regimen in an environmental chamber. Days 1-4 were the Baseline Phase (BL) [68-72 Fahrenheit dry bulb (DB), relative humidity (RH) 40%]. Days 5-18 were the Acclimatization Phase (AC) (DB=100 Fahrenheit, RH=40%). Days 19-39 were the Acclimatization Loss Phase (AL). During AL, the BL environment was maintained for 6 days followed by a retest on the seventh day when the environment was heated the same as during AC. AL continued for 3 wks. The following variables were monitored to assess the physiologic responses to treatment: surface area, % bf, VO_2max, hematocrit, hemoglobin, RPP, cardiac output, workload (WL), perceived exertion, sweat rate, and skin and rectal temp. Participants exercised for 50 continuous min each day at 40% of the VO_2max. Gp 1 exp acclimatization on Day 18 by achieving a WL of 88% of BL. Gp 2 achieved only 64% of the BL WL by Day 18 and did not acclimatize. Following 1 wk of AL, WL for Gp 2 was sig lower than that of Gp 1 (p=0.023). Following 2 and 3 wks of AL there were NSD between gps in achieved WL nor in rate of acclimatization loss. It is recommended that older men acclimatize to work in heat by maintaining proper hydration, alternating light and heavy days, and using HR as an indication of WL.

254. DUNCAN, C.L. The relationship between teacher competency test scores and physical education student teacher performance. EdD in Physical Education, 1989 (C.P. Bahneman)

The major purpose of this study was to examine the relationship between teacher competency tests (Pre-professional Skills Test [PPST] and Content Specialization Test [CST]) and PE student teacher performance (assessed by the WV Univ Teaching Evaluation System [WVUTES]). A secondary purpose was to determine the extent to which student teacher performance can be predicted by scores on teacher competency tests. The relationship between GPA and student teacher performance was also examined. The population was PE majors (population=21; *n*=13 M, *n*=8 F) at WV Univ, who had successfully completed the PPST and CST and had student teaching performance assessed by the WVUTES. Pearson Product Moment r were calculated and a r matrix dev revealing the relationship between the independent variables (CST, PPST, and GPA) and the DVs (WVUTES). A stepwise regression anal was utilized to determine which independent variable(s) was the best predictor of teaching performance. To investigate the diff between (1) gender, and (2) students who passed the teacher competency tests the first time and those that required re-testing, t-Tests and Mann-Whitney U tests were employed. Pearson Product Moment r were also calculated to determine the relationship between the PPST and ACT. The study produced the following conclusions: (1) There were no sig pos or neg r between PPST Reading and Writing and the WVUTES variables; (2) There were no sig pos or neg r between CST, SF, IDA, or TGA and the WVUTES variables; (3) GPA (upper level and overall) was sig correlated with several WVUTES variables; (4) CST PSPEEXS was sig correlated with several WVUTES variables; (5) PPST Math was sig correlated with several WVUTES variables. 4 variables (upper level GPA, overall GPA, PPST Math, and CST PSPEEXS) were sig pos correlated with several of the WVUTES variables and appear to be related to effective teaching as assessed by the WVUTES. Of these 4, those student teachers having high upper level GPAs appear to make the most effective teachers. These student teachers exhibit the best balance of effective teaching behaviors assessed by the WVUTES according to the results of this study.

255. HOPEWELL, R. The effect of fiber and exercise on weight loss and blood lipids in moderately overweight women. EdD in Physical Education, 1989

The lit has shown that a high fiber diet and exercise each contribute to wt loss and alteration of serum lipids. Little research has been done to observe the interaction of these 2 therapies in the treatment of obesity. Therefore, the purposes of this study were to determine whether: 1) the incorporation of dietary fiber into a low calorie diet is more effective than a low fiber diet of equal calorie content in promoting wt loss; 2) a high fiber diet has a more dramatic effect than a low fiber diet on blood lipids; 3) exercise has an additive effect with low and high fiber diets on wt loss and blood lipids; 4) diff occur in fat loss and muscle gain as a result of the use of exercise versus no exercise and/or high fiber versus low fiber diets in achieving wt loss. 32 nonsmoking, moderately overweight, premenopausal F were randomly assigned to 1 of 6 gps. 2 gps followed the high fiber diet; one exercised, one did not. 2 gps followed the low fiber diet; one exercised, one did not. 1 gp exercised but made no diet modifications. 1 gp was the control gp. At baseline, 3 mos, and 6 mos, a symptom limited stress test and underwater weighing were performed. Skinfolds, girth meas and serum apoprotein b, insulin, and lipid profile were obtained. MANOVA and ANOVA using percent of change data were used to anal the data. It was found that a 1200 calorie diet was effective for wt loss in moderately overweight F. The high fiber diet when used with exercise promoted wt loss and the retention of lean tissue. The low fiber diet without exercise resulted in sig wt loss as well as lean tissue. The combination of exercise and diet resulted in lowered apoprotein b, whereas dieting without exercise did not. Wt loss contributed to an increased total time on the treadmill. The addition of fiber to the low calorie diet did not improve compliance.

256. RISHA, M.P. A study of management competency as determined by athletic directors in Pennsylvania public high schools: A probability sampling approach. EdD in Physical Education, 1989

The purposes of the present investigation were to (1) anal and compare the views of selected management competencies held by ADs of public high schools in PA and (2) dev useful descriptive statistics from the demographic data collected to assess (a) AD response diff, (b) AD profile/scope diff, and (c) prog/school diff. A public HS universe file was constructed to draw the sample. The file included the following data elements: AD name and address, Co, school district, HS, low grade, total student enrollment, and percent minority enrollment for each of the 584 in scope HSs within 500 school districts from 67 counties throughout PA. A stratified random sample n of 292 (50%) was selected based on student enrollment level (<500; 501-1000; 101-1500; and >1500). 203

completed sampling packages were returned from the total mailout sample which constituted a 70% response rate. Two questionnaires were included in each sampling package: (1) a profile sheet and (2) a list of 39 statements representing 5 management competency dimensions which included: leading, planning/organizing, evaluating, communicating, and budgeting (Chouinard & Soucie, in press). A confirmatory factor anal was performed to statistically verify the questionnaire's predefined structure. General linear models (GLM) procedure runs were carried out using factor scores, dimension means, and selected numeric data elements as the DVs to assess categorical subgroup diff. Chi-square contingency tables were dev from the descriptive data to accommodate user needs and inquisitions. The best interpretive results of the confirmatory factor anal were realized using the max likelihood method with a promax rotation. Although the management competency dimensions were perceived as being highly important to overall admin effectiveness, results did not support the predefined, five-dimension structure. Four of the five management competency dimensions (excluding budgeting): communicating, evaluating, planning/organizing, and leading were highly interrelated. There appeared to exist a distinct assoc among each of the first three dimensions and specific elements of the leadership dimension. Assuming no prior theoretical knowledge as to the questionnaire's structure, a post hoc exploratory factor anal was carried out to eliminate unimportant questions and to dev a short-scale management competency model. 20 statements from the first three factors of the 11 factor solution, found to be the most important, were grouped into three basic skill areas: conceptual, communication, and technical. GLM findings indicated that ADs whose primary additional responsibility was admin, particularly assistant principal, principal, activities director, or admin of the health and PE prog, were more concerned with management competency than ADs who taught full-time or coached. ADs who possessed an undergrad degree in educ placed less importance on budgeting than the others. ADs over 50 yrs old rated leadership more important than those under 50. ADs over 60 yrs old rated budgeting and communicating higher than those under 60. The size of prog had no sig effect on the perceived importance of the diff management competencies. Some expected results were realized from the numeric information. As the age of the AD increased, so did seniority and income. ADs with the lowest operating budget (<$25,000) had more additional responsibilities. It was found that ADs who coached or who possessed a bachelor's degree outside the field of health and PE/related fields or the social sciences were younger and made less money than those who were assistant principals, principals, or admin of the health and PE prog. A no. of prog diff were found. The no. of junior/senior high sports offered, junior/senior high coaches supervised, and percent black/total student enrollment sig increased between schools with student enrollment levels <1000, 1001-1500, and >1500. Philadelphia City schools had a sig majority of the total black student enrollment (M=76%), were sig larger (M=2336), and offered sig more HS sports (M=22) than all other schools. No sig diff were found at the diff stratum levels regarding additional monies from other sources besides school board funds or AD characteristics such as educ, yrs at current position, age, and teaching load. Many key statistics possessed the reliability level or CV<10% (as prescribed and used by the Bureau of the Census, 1988) needed to be statistically acceptable estimates of the population. Overall findings indicated a need for an 'integrated dimensional' curr or training package to better prepare the aspiring AD. Because of their interrelatedness, categorizing distinctive dimensions (which entail the overall management competency model) by combining 'like dimensional elements' may not be a paramount as is the content of each. The most effective set of management competency dimensions may be those which possess specific elements from each predefined dimension. This logic would not apply to budgeting as it tended to be more distinctive from the other dimensions. The author encourages the use of probability sampling theory in future athletic research. This type of approach is an invaluable statistical vehicle for (1) selecting a well-representative sample from a defined population, while simultaneously considering costs; and (2) making valid conclusions about that population which can be mathematically quantified.

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